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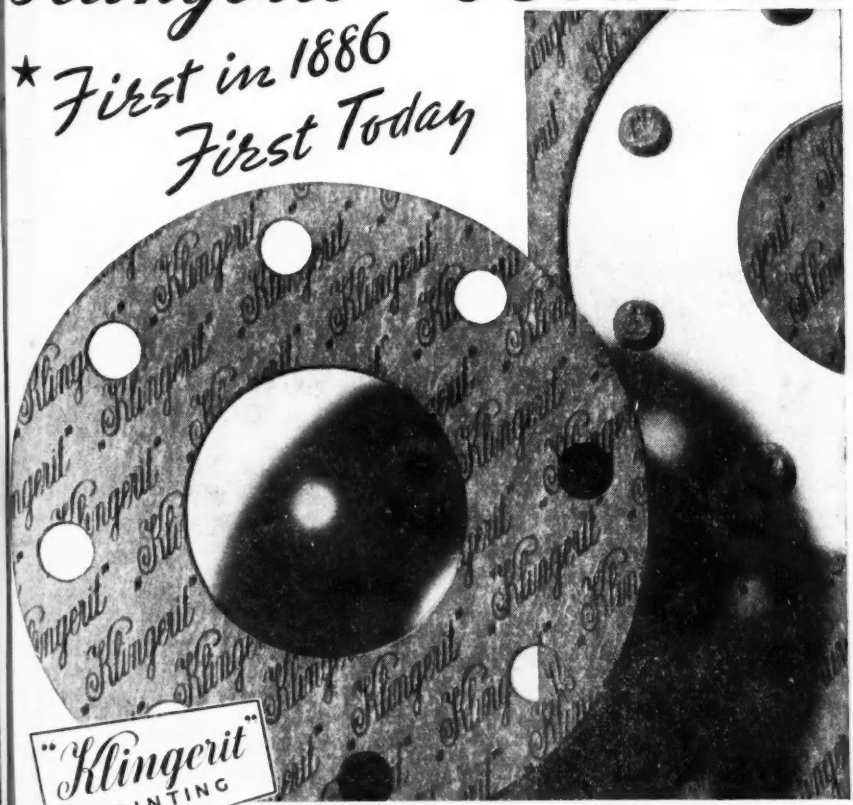

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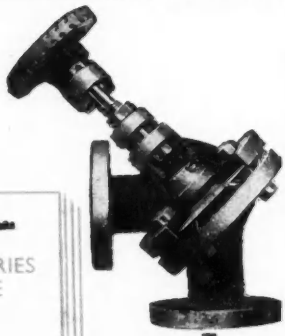

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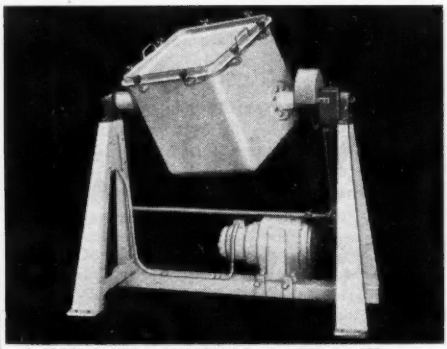

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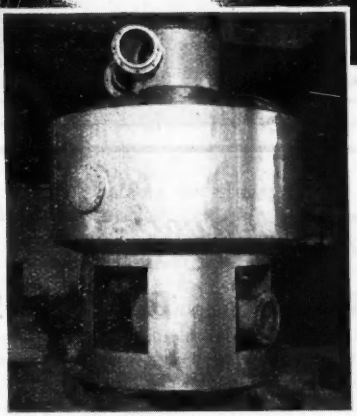

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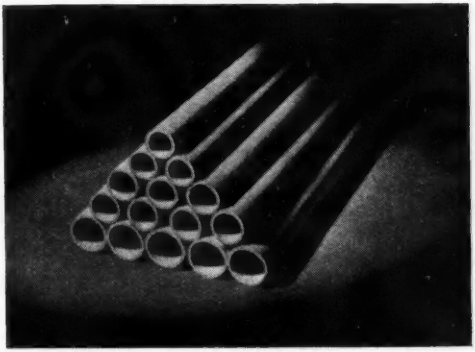

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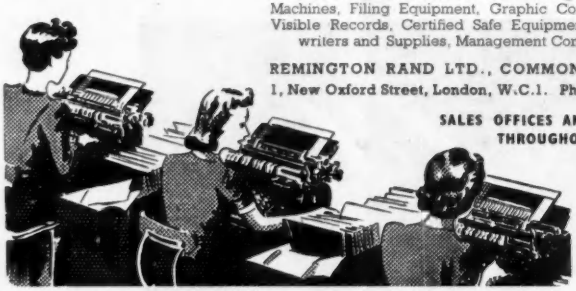

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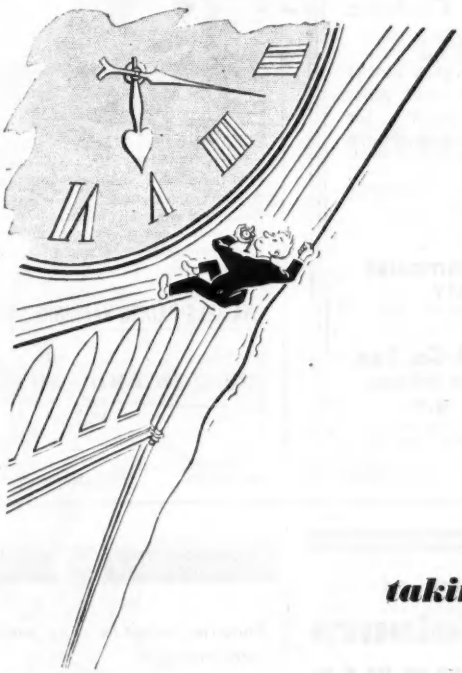

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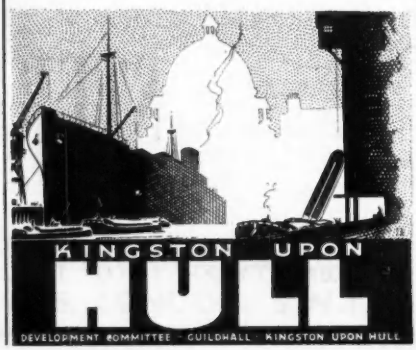

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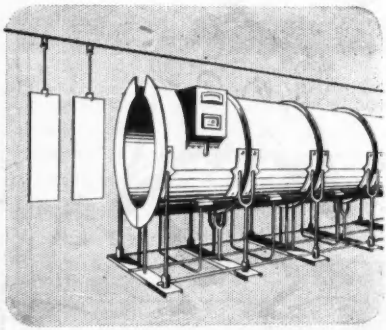

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Staff Selection

THE selection of staff is to-day one of the delicate processes which go to make up chemical industry. It is one of the sciences or technologies in which there is no bibliography and in which precedents afford precisely no help whatever. Almost everyone in chemical industry to-day is acquainted with that problem, as an interviewer or as an "interviewee," and has a fairly clear conception of the shortcomings of prevailing methods.

From the point of view of the applicant, the positions sought may be Government, business, scientific or technical—it matters not very much which—but the essential problem is the same: How to get oneself selected for the position one hopes to fill, or how to select the best man for the job.

From whichever angle one views it, the business is equally unnerving. The hopes and fears of the man who is about to be selected or rejected are very real indeed. His future in life may appear to depend upon whether he gets the job or does not. The selector is in an equally difficult case for he is expected to make a wise decision on evidence which, however carefully one reviews it, is generally deplorably insufficient for the purpose; if he makes a bad decision the least evil will be another square peg in a round hole.

The Civil Service has hitherto accepted the evidence of examinations as the best means of separating the sheep from the goats. This has worked pretty well and has provided us with a bureaucracy that may not be adventurous, but is certainly adept. We have, it is said, the best civil service in the world. Recently, however, new ideas have been stirring and new methods, often used for staff selection in the Army, have been introduced. Those who showed up well enough in written examinations are now subjected to the further "trial by ordeal" in which interviewers holding high places in the Civil Service assess their personality. Those who pass this test are graded into such positions as seem good to the examiners.

This is relatively an innovation and its implications merit close attention. According to the first Civil Service Commissioner, Sir Percival Waterfield, our educational system is not producing the right kind of people. Of 3000 men and women graduates interviewed for the Civil Service no less than 40 per cent applying for the administrative grades and 50 per cent applying for the foreign service scored marks for personality and intelligence that represented complete failure; 5 per cent of the first candidates and 8 per cent of the second were below even the lowest category. Of those who failed, some 60 per cent had university or college scholarships and 20 per cent had State scholarships. This is bad enough, without Sir Percival's footnote that there was a disquietingly large number who seemed unfitted to get a living in any suitable sphere.

That is first of all a remarkable indictment of the present educational system—or it is an equally devastating criticism of the new methods of selection. Both need the most critical examination. The problem of employee selection is highly compli-

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cated and some foolproof procedure, based perhaps on the methods of industrial psychology, would be a boon indeed. The first question that springs to the mind is this: why should the wholly non-productive Civil Service receive the pick of the recruits in personality and intelligence and leave to the productive job of industry and teaching those who fail to show the high qualities? The answer to this is two-fold. The best will generally be attracted to the department offering the highest incentive, excepting, of course, in the existing national selection scheme, which might be possible in a fully regimented State. We rejoice in the fact that the latter deplorable alternative is not available.

Not unnaturally, this criticism of Civil Service candidates has lead to vigorous discussion, which may be summarised under three heads. The first is that the results given by Sir Percival Waterfield are an indictment of our educational system. It is even possible to suppose the cramming that has been necessary for securing scholarships is in itself detrimental to the personalities of those who cram.

The second line which discussion has taken is to question the merits of the psychological methods used for selection for the Civil Service. We have no exact information about these—they are to be published in due course. If they are based on sound principles of psychology as practised, for example, by the Institute of Industrial Psychology, we should be very chary of suggesting that there was anything so fundamentally wrong as to imply that Sir Percival Waterfield's criticism was wholly lacking in fact. A third line of discussion suggests that, while the particular qualities sought in the Civil Service might not be possessed by the candidates interviewed, it is more than likely that they would possess other qualities which would enable them to be highly successful in other fields; which infers that the Civil Service tests are by no means exhaustive.

Very important questions are raised as a result of Sir Percival Waterfield's statement. What is the value of psychological tests? Is our educational system producing the type of personality which present-day economy requires? Are we as a nation deficient in men of the vigorous personality required to bring the country back to prosperity? These and many other problems lie at the root of this comprehensive experiment in employee selection.

Meanwhile, the usual method of employee selection in business is haphazard in the extreme. Broadly, it resolves itself into an inquiry as to what the candidate has done in the past, what schools or universities he has attended and what examinations he has taken. But, for the most part, the candidate who shows up well in a personal interview is likely to be accepted and given the job over the head of some better qualified candidate who is not so good at "selling himself." We have seen some woeful mistakes made as a result.

NOTES AND COMMENTS

Still More Imports

UNUSUAL concern has been displayed in official quarters this week to soften the somewhat alarming import of the apparent gap between the value of imports and exports, which continue to widen. In April it was £54.5 million, although exports had achieved a reasonable rise of £5.4 million, by comparison with the March figure, to the excellent total of £126.4 million. The accountancy, say the authorities, is distorted by the inclusion in the totals of freights and insurances and by other factors, such as the inclusion in one period of sales or purchases of which the benefit is yielded in another. All of which is perfectly credible, it having long been evident that the monthly, or even quarterly accountancy does not afford anything like an exact facsimile of the nation's trading. Some broad outlines are, however, discernible to any who follow these figures month by month, and none has been more apparent than the gradual widening of purchasing of the kind of materials essential for a virile productive policy. In the administration of chemical export policy there has, moreover, lately been some recognition that the need of fuller supplies of basic materials for U.K. industries is as urgent, and in the long run far more remunerative than a financial "catch crop," even of "hard" currency.

Exports Nearly £4 M.

THE April result of chemical export trading, £3,862,371, exclusive of drugs and dyestuffs, represents an increase of nearly £1.2 million above the level a year ago, and shows an encouraging continuation of the better productive conditions which enabled £3,695,151 to be recorded in March. It is not possible to determine to what extent a diversion to foreign markets of chemicals in demand by home industries has contributed, but the increased shipments of sodium carbonate and caustic seem to indicate that overseas markets are again being nursed. There is evidence that artificial conditions still prevail in a number of trading results for the month, notably, for example, in the total of 41 cwt. of synthetic sodium nitrate, of which 1934 cwt. were shipped a month before and over 11,000 cwt. in April last year. This is one of those items of which the U.K. is the traditional supplier of Empire countries when arrivals of normal nitrate shipments from Chile fall short of requirements.

Pollution Problems

A FORM of national enterprise which merits the backing even of the doughtiest adversaries of State participation in industrial affairs has lately submitted an annual report, affording a pleasant contrast with the somewhat unfruitful progress by some organisations more prominently in the public eye. Without the safeguards which the Water Pollution Research Board (DSIR) has provided under the chairmanship of Sir Robert Robinson, and more recently that of Mr. H. W. Cremer, the prospect of continued expansion of some chemical and associated industries would be seriously diminished. Obstacles to industrial development are all too apparent, but none is so fundamental or inescapable as the necessity of disposing of an increasing flow of toxic industrial matter without destroying all forms of life in neighbouring waterways. The legacy of unregulated industrial growth in the last century and the casual discharge of untreated factory effluents more or less directly into the nearest waterway was the creation over hundreds of miles of rivers, especially in the North of England, of conditions more appropriate to the Styx. The point was reached long since beyond which any substantial increase in the flow of untreated effluent in some areas could have been permitted only at the cost of converting some rivers virtually into sewers—and the cost might reasonably have been held to be too high. The Water Pollution Research Board, which is one of the principal sources of fundamental data for the service of industry's own research departments, has been carrying on a series of studies of immediate interest of treatment of industrial waste waters, largely by chemical means. These have served incidentally to show that one of the more urgent problems is to prevent effluents of chemical character incapacitating normal sewage disposal plant. It is satisfactory to note that waste waters from DDT manufacturing need not seriously inhibit the activity of

the " scavenging " bacteria. Hypochlorite liquor, however, continues to present a stubborn problem at disposal plants and the most promising procedure seems to be its recovery, where processes permit, as a saleable solution of sodium hypochlorite.

The Press

A REVEALING commentary on the difficulties of retailing scientific information has lately been provided by Mr. Ritchie Calder, science editor of the *News Chronicle*, who has probably done more than most others to transmit to the man-in-the-street accurate and intelligible digests of the astounding transformations wrought in recent years in the scientific scene. He was one of the very few who overcame the late Lord Rutherford's distrust of " the popular Press," founded on the recollection of many occasions when well-intentioned efforts of pressmen to interpret the results of his studies had had lamentable results. Lord Rutherford capitulated and by collaborating with the journalist did much towards presenting contemporary science to the general public in something like its true perspective. Calder has also presented the other side of the picture, what he describes as " the illiteracy and inarticulateness of the great majority of scientists "—with some honourable exceptions from the past, " Tyndall, T. H. Huxley, Ray Lankester, Arthur Thomson, William Bragg, Julian Huxley, Lancelot Hogben, J. B. S. Haldane and, pre-eminently the late H. G. Wells. . . . a noble procession of expositors." This study forms an interesting chapter of "The Press," a survey of the great development of newspapers and periodicals between 1898 and 1948 and the increasing value of the public services they render. Published by the *Newspaper World*, "The Press" serves also to commemorate the completion of 50 years' existence of the journalist's own newspaper and—unlike some science expositions—presents its subject in lively and intelligible terms.

Atomic Policy

A HINT that controversy regarding the dissemination and use of information in this country about nuclear physics involves scientists as warmly as it does politicians is contained in a significant restatement of policy of the Institute of Physics, which is presented in the current 28th annual report. This says that "Following the circulation to members in April, 1946, of the statement that ' The board was in full agreement with the views expressed by the president of the Royal Society regarding atomic energy and secrecy,' and the reprinting for the convenience of members of his statement, the board received correspondence from members at home and overseas." These evidently called for a firmer statement of the Institute's own policy, and the amplification which has now been found necessary takes the form of five separate statements. From these it is permissible to surmise that scientists urged the Institute to use its authority to the end that atomic energy should be used only for peaceful purposes and that secrecy should be relaxed. The board understandably rejects the suggestions—which fairly evidently have been made—that it should itself take steps to secure these objects. Its preference instead to leave to politicians the promotion of international agreements, without which little can be done, is reasonable enough. Here science has inextricably mixed with politics and there is some excuse for the prevalent tendency in scientific circles " to sit on the fence." The board itself, however, gives some leadership: " We believe," it says, " it is the duty of scientists who can make a contribution to the solution of this problem to take action in accordance with their political or ethical beliefs to further this end, and so form where necessary associations of like-minded individuals."

Disillusionment

It may well be that 1948 will be a year of disillusionment, declared Sir James Lithgow, presiding last week at the annual meeting at Parkhead, Glasgow, of William Beardmore & Co., Ltd. Conditions of uncertainty and frustration still obtained, said Sir James. To those people " who listened to the song of emotion rising in the heart rather than to the voice of reason coming from the head," 1947 had been a year of disappointment. Until the illusion of industrial prosperity by legislative action was dissipated, it would be difficult for boards of companies such as theirs to see clearly how best to conduct their affairs. Output was strictly limited by what their suppliers of raw materials were prepared to produce.

GOOD LABOUR RELATIONS

I.C.I. Chairman on Collaboration with Unions

AMID prevalent economic problems, when a return to something like prewar prosperity is vitally dependent on ever-increasing production, it is refreshing and salutory to note that the chemical industry, unlike some of the other basic industries of the country, can report a year of progress in the development of good relations between employer and worker. It has, indeed, been a year virtually free from discord, and credit is due to both sides for the clear thinking, and reasoned practical handling of labour's aspirations, that have permitted the introduction of a shorter working week and increased wages.

Testimony of this happy state of affairs is provided by Lord McGowan, I.C.I. chairman, in his statement circulated with the 1947 report and accounts. He says:

"Frank Understanding"

"The company's relations with the trade unions have been maintained on the basis of a frank understanding of our respective problems. During the year discussions were held with the trade unions in order to define more clearly negotiating procedure on questions of wages and conditions of employment. I am pleased to say that these discussions culminated in an agreement."

Lord McGowan said the trade unions had recognised the company's works council scheme, which would therefore in the future be of still greater value. The unions had also recognised the freedom of employees to associate themselves with the advisory and consultative functions of works councils. In order that negotiations under the new procedure might be conducted on a representative basis, the company had given an undertaking that, although union membership is not a condition of employment, it would bring to the notice of workers its view that they should be members of an appropriate union signatory to this agreement.

Shorter Working Week

With regard to the introduction of a shorter working week, the chairman said the reduced normal working hours were now 44 hours a week for day workers, and an average of 42 hours a week for those on continuous shifts. The trade unions were co-operating in measures designed to ensure the maintenance of the former level of output, and its expansion where possible.

It had so far been difficult to assess the results, however, owing to various factors which had affected production during the subsequent period.

In negotiations for claims for higher wages from the Engineering and General Workers Unions the company had expressed the view that to concede any advance, which would not demonstrably increase production, would be contrary to the lead given by the Government to industry.

On the subject of wages, Lord McGowan said there had been some uncertainty as to whether the Government intended to control wages. But this was clarified when the general council of the Trade Union Congress received an assurance from the Government that there was no intention to interfere with the freedom of employers' and workers' representatives to regulate wages by collective bargaining.

Subsequent negotiations with the unions then resulted in an agreement with both the Engineering and General Workers Unions for increases giving 7s. 4d. and 7s. 1d. respectively for a normal working week. The new rates became operative between December 8, 1947, and January 5, 1948. The cost to the company for a full year was approximately £940,000.

Pension Fund

Employees engaged during the war had not been offered membership of the respective pension funds on joining the company. Many such employees were still in the company's service on an established basis, and all of them had been offered an opportunity of contributing towards the purchase of back service in the pension funds so as to make their war-time service rank for pension purposes. About 6000 members of the staff and 8500 workers had taken advantage of these facilities, and the company has paid its share of the total cost of such purchase.

The statement also contained interesting references to research. More time was being devoted to the study of fundamental scientific problems, the solution of which could be applied to chemical and metallurgical manufacturing processes at a later stage. A prominent feature of this research was an increased study of the potentialities of a number of new physical techniques developed during the war years. These included the application of the electron microscope to the study of small particles and surface phenomena, of the infra-red spectrometer to chemical analysis, and of artificial radioactive elements to chemical and biological problems.

The new science of electronics was also proving to be of the utmost value in the design of instruments for the regulation and control of manufacturing operations.

CO-OPERATIVE PAINT MARKETING

Export Plan for Standardised Products

THE project to expand British paint exports by co-operative marketing by some 130 companies of standardised products through the agency of Associated Paint Manufacturers, Ltd., was officially launched at the Savoy Hotel, London, last week, at a luncheon arranged by the Paint Manufacturers and Allied Trades Association.

Limitations of State Intervention

Proposing the toast of the association at the luncheon, Sir Patrick J. Hannon, M.P., speaking as president of the National Union of Manufacturers, said that the organisation had watched with great interest the growth of one of its youngest and most virile affiliated trade bodies. He recalled that the association came into existence in 1941 to fight a threat of concentration of the medium and smaller firms.

They won that fight and made political history in the process, as the decision for concentration had already been made and was revoked through the efforts of the association. This country sadly needed to-day men of the vision, courage and pertinacity which members of that association had shown, continued Sir Patrick, and the discovery was now being made in high circles that State intervention could have little hope of directive power in competitive industry unless at the same time freedom was given to the individual to make the full contribution which only he could make.

The time had come when the intervention of the State, ill-advised, ill-directed and ill-furnished and without the intimate contact with the problems of industry, must be halted and when fair play to those who had to bear the burden must make people reflect how much further the State could load productive enterprise at the expense of the taxpayer.

Protecting Small Manufacturers

Responding to the toast, Mr. R. B. E. Jackson, president of the association, said the organisation, which existed principally to cater for the problems of the medium and smaller manufacturers, began to consider in 1947 how such firms could make their contribution to the export drive. They decided to sink their differences as individuals and competitive manufacturers and to form a co-operative export group which would make paints to common formulæ, to standard colours, packed in a common form and sold at agreed prices.

In the interests of efficient production, participating firms were divided into various categories so that certain manufacturers would make one quality or one colour for the whole of the group. Such a scheme under which firms would be prepared to sink their individuality was not easy to arrange. It meant many months of visits to branches and firms all over the country, but the response and agreement had been extremely gratifying.

Members of the association who had not sufficient plant to participate in the scheme had undertaken to pay a substantial contribution for three years as a goodwill gesture. The Board of Trade had granted special allocations of scarce raw materials to make export production possible.

To operate the scheme a separate trading organisation known as Associated Paint Manufacturers, Ltd., had been formed.

A technical committee to decide and allocate formulæ and colours of paints, distempers and varnishes; a costing committee to fix prices; and sales and publicity committees to market the products had all been formed.

Much Hard Work

That had meant much hard work, but they would be fully recompensed if in result the medium and smaller manufacturers who could not efficiently carry on an export trade on their own account should by means of this co-operative venture be able to make some contribution to the development of our export trade.

Mr. F. W. Harris, M.P., responding to the toast of the guests, said they were celebrating that day a wonderful achievement on the part of private enterprise. That 150 firms should be willing to subjugate their individual ambitions and prestige in a common effort for the national good gave the lie direct to those politicians who saw in private enterprise nothing but selfish interest.

A message from Mr. Harold Wilson, President of the Board of Trade, wishing the scheme every success was read at the luncheon.

Joint Export Policy.—By an arrangement between F. W. Hampshire & Co., Ltd., and Reckitt & Colman, Ltd., certain of the Hampshire products in most markets outside the United Kingdom will be handled by the overseas organisation of Reckitt & Colman, Ltd. It is proposed to form a joint company for the purpose, which should be of considerable benefit to both companies.

RISING LEVEL OF EXPORTS

Nearly £4 M. in April

CHEMICAL export totals for April, recorded in the month's Trade and Navigation Accounts (HMSO. 4s. 6d.), show that the successively higher figures for March (£3,695,151) and February (£3,300,041) have again been exceeded. Exclusive of drugs and dyestuffs, etc., chemical exports rose to a value of £3,862,371, which is approximately 50 per cent higher than in April last year.

Most notable of the advances on the previous month occurred in the field of sodium compounds, which section incidentally also provided the largest decrease. Exports of sodium carbonate at 530,600 cwt. (217,314), caustic soda 203,966 cwt. (77,800), sodium silicate 11,012 cwt. (1586), and sodium sulphate 38,236 cwt. (4810) represent remarkable increases, while the 11,894 cwt. of synthetic sodium nitrate shipped in March dropped to only 41 cwt. in April. The Board of Trade informs THE CHEMICAL AGE that this reflects Government policy of supplying Empire countries only when Chilean exports are inadequate.

While exports on a greatly increased scale occurred in most departments of the industry, aluminium oxide 54 tons (789), tar oil 1,866,737 gal. (3,204,551) and benzol 617 gal. (200,466) displayed the opposite tendency, all three instances indicating the priority given to supplying home consumers engaged in the export drive.

On the import side of the balance sheet—with two outstanding exceptions, calcium carbide 7183 cwt. (39,666) and manufactured fertilisers 8194 tons (14,089)—all commodities were shipped here on increased scales. Notable instances were borax 51,340 cwt. (17,568) coal-tar products 17,846 cwt. (3,374), bromine and bromides 1247 cwt. (none), sodium nitrate 39,880 cwt. (none), and carbon black 108,263 cwt. (82,037).

CHEMICAL EXPORTS IN APRIL

	April, 1948	April, 1947
	Cwt.	Cwt.
Formic acid	2,316	1,831
Tartaric acid	492	228
	Tons	Tons
Aluminium oxide	54	789
Sulphate of alumina	3,477	2,363
Ammonium sulphate	11,045	9,558
Ammonium nitrate	7,420	10,109
	Cwt.	Cwt.
Bleaching powder	47,865	38,703
Calcium carbide	1,738	511
	Gal.	Gal.
Benzol	617	200,466
Cresylic acid	239,637	233,598
Tar oil, creosote, anthracene oil, etc.	1,866,737	3,204,551
	Cwt.	Cwt.
Naphthalene	2,753	1,633
Nitrocellulose	3,814	614
Disinfectants, insecticides, weed-killers, etc.	61,225	63,295
	Tons	Tons
Copper sulphate	3,353	2,995
	Cwt.	Cwt.
Glycerine	1,165	409
Nickel salts	5,632	2,548
Lead acetate, litharge, red lead, etc.	11,028	5,953
	Tons	Tons
Magnesium compounds	774	661
	Cwt.	Cwt.
Potassium compounds	9,198	6,311
	Tons	Tons
Salt	12,216	9,293
	Cwt.	Cwt.
Sodium carbonate, soda ash, etc.	530,600	217,314
Caustic soda	203,966	77,800
Synthetic sodium nitrate ...	41	11,894
Sodium silicate	11,012	1,586
Sodium sulphate	38,236	4,810
Tin oxide	444	815
	Tons	Tons
Zinc oxide	812	725
Total value of chemical manufactures, excluding drugs and dyestuffs	£3,862,371	£2,663,706
Quinine and quinine salts ...	Oz. 92,752	Oz. 95,865
	Mega units	Mega units
Penicillin	322,693	82,819
	100 International units	100 International units
Insulin	738,569	1,347,681
	Lb.	Lb.
Acetyl-salicylic acid	412,149	99,724
Total value of drugs, medicines and preparations	£1,179,633	£1,102,734
Total value of dyes and dyestuffs ...	£772,044	£653,974
	Cwt.	Cwt.
Chemical glassware	1,760	933
Value	£62,621	£34,192
	Tons	Tons
Furnace plant	681	270
Value	£122,845	£45,002

CHEMICAL IMPORTS

	Cwt.	Cwt.
Acetic acid	24,339	14,208
Boric acid	7,920	5,800
Tartaric acid	—	—
Borax	51,340	17,568
Bromine and bromides	1,247	—
Calcium carbide	7,183	39,666
Coal tar products (excluding benzol and cresylic acid) ...	17,846	3,374
	Tons	Tons
Ammonium phosphate	—	—
Manufactured fertilisers (including superphosphate of lime, bone-meal, etc.)	8,194	14,089
	Cwt.	Cwt.
Potassium chloride	704,810	613,857
Potassium sulphate	64,500	11,020
Other potassium compounds ...	3,099	2,126
Sodium nitrate	39,880	—
Carbon black	108,263	82,037
Total value of chemicals, drugs, dyes and colours	£2,504,756	£2,101,287

Scottish Chemicals

Central Research Proposed

THERE are possibilities of big extensions in the chemical industry of Scotland, particularly if some of the power of the hydro-electric schemes can be made available to it and if firms make more use of scientific research workers. These possibilities are indicated in the Report of the Committee on the Chemical Industry of Scotland, which has just been published by the Scottish Council (Development and Industry).

The report recommends that contact should be made between the chemical industry and the shipping interests to reduce the economic burden of transferring Scottish-made material to southern ports for shipment. It also points out that it may be necessary to develop new chemical industries in remote areas, close to sources of raw material, and stresses that housing requirements should receive special consideration from the Government departments and local authorities concerned.

The possibility of a central research laboratory to serve the whole of Scotland was considered in the report, and at a Press conference at Edinburgh last week, Prof. W. Cumming, who occupies the Chair of Technical Chemistry in the Royal Technical College, and who is chairman of the committee appointed by the Scottish Council to inquire into the chemical industries of Scotland, said that the chemical industry was the most important key industry of the country. It was attempting to convert nature's raw materials into commercial products, and was concerned not only with the manufacture of chemicals, but with the supplying of materials for the use of other industries.

I.C.I. Store in Flames

A spectacular blaze accompanied by a number of minor explosions resulted from a fire last week at the premises of the old Greenway Iron Works, Hutchinson Street, Widnes, in the occupation of I.C.I. General Chemicals Division as a storehouse for empty oil drums, oil transformers, and large acid carboys. The blaze spread to a large brick building on either side of which were wooden sheds. These were soon demolished. Several explosions occurred, and gas-filled drums were flung into the air when they came in contact with the heat. At the far end of the works from Hutchinson Street a larger sulphur pit ignited, and gave off fumes which drove firemen and helpers to safer places. Two hours elapsed before the fire was under control.

Oil Equipment Delays

Weak Organisation Alleged

ADDRESSING members of the Council of British Manufacturers of Petroleum Equipment at Newcastle last week, Mr. D. A. S. Williams, export department manager, Shell Petroleum Company, warned petroleum equipment manufacturers that unless British oil companies were given reliable delivery dates, the companies would be forced to order their materials from other sources. Mr. Williams alleged that nearly half of the suppliers were incapable of giving even an approximately accurate delivery date and said that, in his view, this was due to weakness in the internal organisation of equipment firms and lack of liaison between their sub-contractors and raw material sources. Only half of the orders worth more than £40 million placed by the British oil industry for delivery last year had been delivered.

FLUORINE CLAIM

EDINBURGH Court of Session last week refused a reclaiming motion by the North British Aluminium Company against an earlier decision allowing proof in a petition for interdict against the company brought by the Ben Nevis Distillery (Fort William), Ltd. The case will accordingly be the subject of a further hearing. At the preliminary hearing last March the latter company alleged that fumes from the aluminium works had contaminated vegetation in the area and was capable of causing fluorosis in animals grazing there (THE CHEMICAL AGE, March 27).

The respondents deny the charges and contend that a modernisation scheme for their factory, to be completed by 1950 at a cost of £500,000, will reduce fume emission to negligible proportions. They also plead that approval of the interdict would seriously harm the aluminium industry in Britain, which depends to a very considerable extent on this plant.

NEW TUBERCULOSIS DRUG

A REFERENCE to the treatment of pulmonary tuberculosis by administering orally para-aminosalicylic acid (PAS) is made in *The Lancet*. This, a white powder, is given in solution, and avoids the unpleasantness involved by injections.

The report quotes a hospital superintendent who supervised the treatment of six patients over a period of 60 days. He said that all patients' temperatures fell rapidly, and clinically their improvement had been "most striking." It is considered likely that the chemical may prevent the germ from multiplying.

CHEMICAL SHORTAGES IN GERMANY

Currency Difficulties Prevent Export Revival

A CONSIDERABLE increase in the home demand for chemicals is reported from various regions of the combined Anglo-U.S. zone of Germany. The cell wool works in southern Germany have been able to obtain substantial quantities of wood pulp from the Scandinavian countries, especially Sweden and Finland, and the rayon factories of Bemberg at Oberbarmen and I.G. Farben at Dormagen have been supplied with appreciable tonnages of cotton linters from the United States. As a result of this sudden improvement in raw material supplies, these works are finding their supplies of caustic soda and sulphuric acid inadequate, and special efforts are being made to overcome the deficiency.

The demand for chemicals from the textile industry and especially from rayon factories is expected soon to increase further. While the Glanzstoff-Courtaulds works at Cologne and the I.G. Farben plant at Dormagen are producing limited quantities of fibres for industrial purposes, especially for tyres and conveyor belts, all other rayon and staple fibre works are now concentrating on fibres for the textile industry. The impending re-opening of the Rheinische Zellwolle plant at Siegburg will intensify the demand for chemicals.

In the U.S. occupation zone the production of soda, paints, varnishes and lacquers is reported to be increasing. The rubber industry has received larger supplies of crude rubber, a fact which has drawn attention to the shortage of carbon black and synthetic fibres for tyres. Increased imports of copra and peanuts have enabled the vegetable oil refining industry to replace to some extent the declining supply of animal fats, bones, etc. The shortage of stearine, oleine and glycerine is, however, still being felt acutely in various quarters and glue manufacturers are also complaining of growing supply difficulties.

Disappointing Exports

Hopes that improved supplies of certain key chemicals would result from recent trade agreements with Sweden, Holland, Belgium and other countries have been only partially fulfilled. The export trade in chemical products, on the other hand, is being adversely affected by the insistence on payment in hard currencies on the part of the JEIA foreign trade agency. The saline salt industry, which in 1947 exported 11,000 tons of salt to Norway and Sweden, has been unable to book a single export order; a contract for 4500 tons of salt for British colonies in West Africa early this year having been cancelled.

Rock salt exports, which in October-December, 1947, reached 50,000 tons, have declined to 10,000 tons in January-March, 1948. This is partly due to the fact that salt importing countries are unwilling to provide dollars for this commodity and partly the result of competition from the Soviet zone of Germany, where piece rate payment and the grant of special incentives to workers have resulted in an increase of the salt and potash production. As a result, the salt industry has not been able to make full use of all available export authorisations.

Alumina Production Resumed

The production of alumina from bauxite stocks at local reduction works has been resumed. The plants concerned are those at Toeging and Schwandorf in Bavaria, Luenen in Westphalia and Rheinhausen, near Lake Constance. From the available stocks of 270,000 tons of bauxite, some of it of rather inferior quality, about 100,000 tons of alumina are to be produced. Some 40,000 tons of alumina will be used for chemical purposes, but some of the works will not come into operation until later this year.

Little has lately been heard about the progress of reconstruction in the chemical industry of the eastern zone. The Leuna plant has received orders to concentrate chiefly on the production of chemical fertilisers. The buna works at Schkopau, which were mentioned on various occasions last year because of their quick recovery, is now to dismantle 60 per cent of its plant capacity, according to a report from Western Germany.

Additional labour has been directed into the metal mines of the Ore Mountains. Mansfelder Kupfer- und Huettenwerke are drilling a new shaft north of Sangerhausen, and several thousand more workers will be employed here when the new mine is put into commission, probably not before 1950.

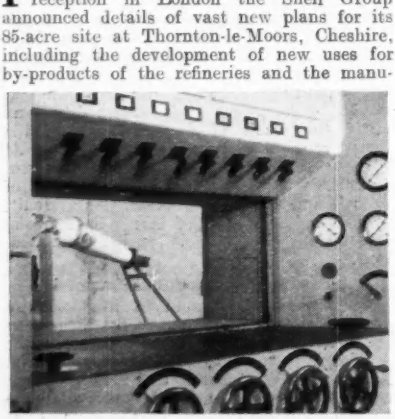
German Crude Oil Imports

The authorities in the combined British-American zone of Germany intend to import 220,000 tons of crude oil in the second half of the current year. Of this, 132,000 tons are to be shipped from Venezuela, the remainder from the Near East. All will be refined by German plant, but as not all the plants are at present capable of producing motor fuel it is hoped to process lubricants, and other products.

DEVELOPING PETROLEUM CHEMICALS

Scope of " Shell's " Thornton Establishment

FOURTEEN months ago at a Press reception in London the Shell Group announced details of vast new plans for its 85-acre site at Thornton-le-Moors, Cheshire, including the development of new uses for by-products of the refineries and the manufacture of a wide range of industrial chemicals from petroleum.



In this specially designed test cell in the aero engine laboratory the behaviour of fuels, in combustion chamber tests behind a thick protective window, is watched and recorded

On Thursday last week, 200 business executives attended the formal opening of the company's Thornton research centre and were able to see for themselves the staff of nearly 900 scientists and technicians performing in specially equipped laboratories and testing cells, intricate experiments designed to pave the way for the manufacture of numbers of petroleum products, from aviation fuels to domestic soaps, from specialised marine and aviation lubricants to richer and more effective soil fertilisers. Their work forms part of a long-range plan which the company claims will ultimately render Britain self-supporting in many types of important chemical products, with a consequent saving of millions of dollars.

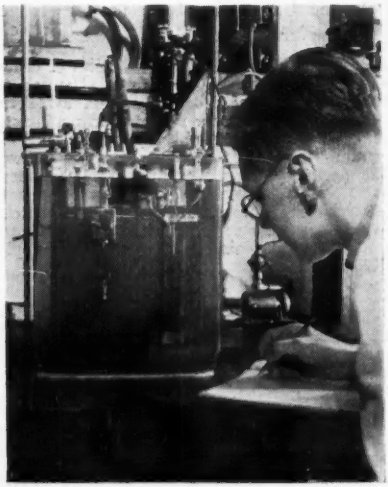
The opening ceremony was performed by Mr. George Legh-Jones, managing director of the Shell Refining and Marketing Co., Ltd., and distinguished guests included the First Sea Lord, Admiral Sir John D. Cunningham, Air Chief Marshal Sir Arthur Barratt and Lt.-Gen. J. H. (" Jimmy ") Doolittle, famous wartime U.S. Air Commander in the Far East and now vice-president of the Shell Union Oil Corporation.

A new fuel laboratory has just been added to the centre and the opportunity was taken of marking its completion by identifying it with the official opening of the whole plant.

In his opening speech, Mr. Legh-Jones, after briefly reviewing the growth of the research centre since its inception in 1940 and the valuable contributions its scientists made towards the solution of fuel problems during the war years, said that present experiments included the evolution of special fuels for stratosphere flight, the mastery of starting difficulties experienced by engines in extremely low temperatures and the production of petroleum derivatives which will assist other industries.

In the latter connection, Mr. Legh-Jones mentioned that during the refining of lubricating oil a certain amount of extract is produced which was previously burnt as boiler fuel. Shell chemists have transformed this extract into a satisfactory rubber " extender " which is now being used in the rubber industry to give additional elasticity both to natural and synthetic rubber.

In the adjacent oil refinery at Stanlow, Mr. Legh-Jones continued, the Shell Group had the largest petroleum plant in the U.K. and enlargements at present being made



This is the Pirelli apparatus which enables exact measurements to be made of gassing characteristics of electrical oils

would raise it to the status of the most extensive and complete refinery in Europe.

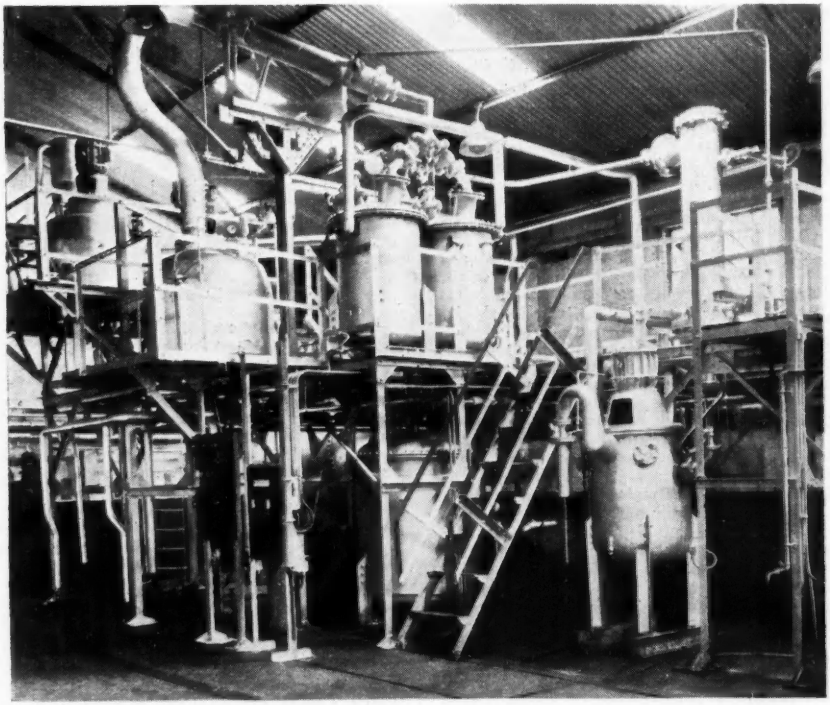
The interdependence of Thornton and Stanlow illustrated the petroleum industry's acceptance of the value of scientific research at all stages, not only in the production of oil but its application to many fields of human activity. One of the major reasons for these new developments was the still-rising demand for petroleum, which far exceeded world supply. Output, greater than ever before, still lagged seriously behind current needs, principally due to two other shortages—steel for equipment and ships for transport.

Lt.-Gen. Doolittle, speaking, as he phrased it, "not as a petrol pedlar but as an air commander," paid tribute to Thornton's wartime activities and said that during those critical years the Allies had been short of pilots, planes, mechanics, bombs and ammunition, but there had never been a single occasion when the operations of his command had experienced a lack of petrol. The work being undertaken at this latest Shell plant would ultimately contribute towards a higher standard of living for all.

After the official opening, visitors in small groups were taken upon a conducted tour of the installations, and research experts explained the activities of the units, which fall into two main groups—the Engine and Chemical Divisions.

Production of Chemicals

Chemists in the party were particularly interested in research work being conducted in the laboratories of Thornton's Chemical Division. In the main laboratory the production of paints and varnishes from



The Thornton pilot plant which is producing, in bulk quantities, additives for lubricating oils. The use of stainless steel in the vulnerable sections eliminates corrosion problems

petroleum bases is considered by the Shell Group to be of prime importance in view of the acute shortage of linseed oils.

The cracking of paraffin wax has led to further experiments which have finally resulted in the production of a material much sought after by perfume manufacturers. The laboratory layout dealing with the conversion of olefin to methyl heptyne carbonate commanded wide interest.

Demonstrations of recent advances in the production of synthetic detergents from petroleum, including the new soap-oil, "Teepol," which completely overcomes water hardness and does not formulate wasteful "scum," emphasised the rapid strides being made by Shell chemists in this direction.

Hydrogenation apparatus and metal detection by the polarograph method are features of the micro-analytical laboratory and in another section a close investigation is being made of the properties of various greases with a view to increasing their use in domestic and industrial spheres.

Pilot Plant Development

Equally important research is being conducted in connection with the plastics and rubber industries. Ester type plasticisers and polyvinyl chloride compositions are undergoing a variety of tests, and recent investigations have shown that by-products of petroleum are beginning to have a much wider application in the rubber industry.

Pilot plant installations work in close conjunction with the chemical section and visitors found much to interest them in the Ionex plant for the manufacture of lubricating oil additives. This small-scale installation produces 200 lb. in each batch. Another pilot-plant was in operation for wax-cracking. These "pots and pans" installations, as their operators term them, are doing valuable work in transforming laboratory processes into commercial production.

In the metallurgical laboratory special apparatus which produces coatings for aero engine exhaust valves. The coating is diffused into the valve metal by heat treatment.

Work in the engine research group deals with the fuel problems confronting the aviation and motor industries, diesel engine performance and the study of high load-carrying lubricants. An important work upon which Shell technicians are engaged at the present time is directed towards obtaining a more even distribution of the tetraethyl lead content in fuel between the individual cylinders of automobile engines. The replacement of the use of the carburettor by direct petrol injection into the cylinders or inlet ports is now being tried on vehicle engines with the object of reducing fuel consumption.

At Thornton, experiments are being conducted to overcome cylinder and ring wear resulting from the high sulphur content of certain diesel fuels. This is being achieved both by the introduction of chemical agents in the fuel and the use of new metallurgical techniques, including the coating of cylinder bores with a type of porous plating. Some success has resulted.

The lubricating oil laboratory contained much to interest visitors. Particular attention is being paid to the development of improved oils for transformers, cables and capacitators, and new processes in spectroscopic and X-ray examination are proving invaluable. Problems of gear lubrication at low and high speeds in the industrial field are also being investigated by Thornton's scientists, and test engines are being run under conditions designed to give prominence to the particular features under study, such as cold corrosion, cylinder wear and sludging.

While visitors filed through one of the test cells in which, on a special rig, piston rings were undergoing trials, there was a ring seizure. Within four minutes the unit was stripped and examination commenced.

To study the starting and re-starting of aircraft engines in extremely low temperatures, the centre possesses a cold room in which engines are subjected to temperatures to —60° C. The Aero Research Laboratory is also developing test methods for the study of ignition and combustion in gas turbine engines.

The Growth of Thornton

The establishment of the centre began just before the war with the planning of an aero engine research laboratory. This was constructed in 1940 and was in full operation two years later. In 1943 two new wings were added, one for chemical and metallurgical work and the other for engine testing. Work was completed upon these extensions by 1945. Other laboratories for the study of problems associated with the fuel industry were built and in 1917 these units were finally embodied into the present research centre, which is now under the control of Brigadier R. A. Bagnold.

The laboratories occupy a 30-acre site and have a floor space of 730,000 sq. ft. Nearly 80 engines are housed in the sections, besides a number of rigs and appliances for small-scale work. Thornton is the largest and most up-to-date oil and chemical/oil research centre in the Commonwealth, and when extensions are complete the nearby refineries at Stanlow will be capable of refining nearly 4 million tons of crude oil a year.

THERMAL CRACKING OF ETHANE

German Synthetic Oil Procedure

THE demand for large quantities of ethylene in Germany for use in synthetic oil manufacture led the I. G. Farben plants at Oppau and Leuna to develop a process for the thermal cracking of ethane, and by 1944 a pilot plant was in operation, says a report from Mr. Francis J. Sergeys of the Ethyl Corporation, New York City, who investigated the process in Germany on behalf of the Office of Technical Services, U.S. Department of Commerce. Mr. Sergeys states that it was planned to put the process to full use in a plant at Heydebreck for the production of 6 million lb. of ethylene a month, but the war ended before the plant was completed.

There was apparently considerable rivalry between the proponents of the partial oxidation process which had previously proved operable on a large scale, and the thermal cracking process. The decision to install the thermal process was due to the fact that the oxidation process required oxygen supplies and Linde fractionating equipment, neither of which was readily available. The thermal process, on the other hand, required only a relatively simple ethlyene recovery system. Moreover, the complete absence of carbon monoxide in the thermally produced ethlyene made it an ideal feed stock for polymerisation in synthetic oil production.

"The most interesting and probably the most valuable aspect of the Oppau development," the report states, "was the use of a copper nitrate-ethanolamine solution for the absorption of ethlyene from the cracked gas mixture, and the subsequent release of the olefin from the solution. This development appears to offer a relatively simple method of separating olefinic materials up to and including propylene from the aliphatic homologues without the use of large fractionating columns and the low temperature usually associated with these separations."

Oppau Process

The process as developed at Oppau was as follows :—Fresh ethane (90 per cent purity) is mixed with a low-pressure ethane recycle gas stream and compressed to 3-4 gauge. The gas is desulphurised by scrubbing with ethanolamine. Any entrained solution is removed by adsorption in an activated charcoal tower. The pressure is reduced to 0.5. The desulphurised gas is preheated in a steel coil to 450°C., and cracked in a chrome steel coil at a temperature not exceeding 800°C. The cracked gas is then quenched with water and passed over a nickel oxide-chromium catalyst for conversion of acetylene to ethylene. The cracked gas is then compressed and passed through an activated charcoal tower to remove hard-boiling hydrocarbon fractions, including lubricating oil. The gas is next scrubbed with a solution of copper-ethanolamine-water in a packed tower for the removal of olefinic constituents.

The olefin-rich solution is expanded to 2-3 atm. to remove dissolved and mechanically held ethane, which is recycled to the recovery compressor. The degassed copperamine solution is expanded to 150 mm. mercury pressure (absolute) at which point the olefins are released. The ethylene product is washed with dilute sulphuric acid to remove ammonia, and with dilute caustic to remove carbon dioxide and the entrained acid. The washed gas is then compressed for subsequent processing. The product contains 92-95 per cent ethylene, propylene and ethane being the principal diluents.

Selective Absorption

The unabsorbed gas from the olefin wash tower is passed through an oil absorber in which the ethane is absorbed, permitting the hydrogen to leave the system essentially free of ethylene and ethane. The rich oil is expanded in two stages to atmospheric pressure. The ethane from the first stage is at sufficient pressure to be mixed with the feed to the cracking furnace, while the gas from the atmospheric expansion is mixed with the fresh ethane.

Each step of the process is described in detail in the 27-page report, No. PB-86765, entitled "Thermal Cracking of Ethane." Also included are a flow sheet, furnace diagram, a graph showing the time rate of ethylene absorption, yield tables, and several other pertinent graphs and tables. Copies of the report may be purchased in photostat form for $3.00, or in microfilm for $1.50 from the Office of Technical Services, Department of Commerce, Washington 25, D.C.

ITALY'S SURPLUS LEAD

THE lull in industrial demand for lead in Italy has compelled producers to concentrate upon export markets and during the first four months of this year over 6000 tons of lead left Italian ports, while applications for export licences for a further 12,000 tons have been filed with the Government. Domestic requirements, which before the war amounted to 40,000 tons per year, have now dropped to 30,000 tons; total annual output is roughly 88,000 tons of ore of 60 per cent lead content.

MODERN METHODS OF ANALYSIS—II

Development and Use of Reagents and Indicators

From a Special Correspondent

IN order to survey the field of modern analytical chemistry it is convenient to use a classification which corresponds roughly to the contributions made by the two fields already mentioned, and to regard the development as having taken place broadly along two channels which can be classified as (1) new reagents, and (2) new apparatus. Many of the techniques fall into the category of microchemical analysis. It is true that microchemists are not wholly agreed on the interpretation to be applied to this latter term. Some include in it any operation which aids in the detection or determination of a small amount of material, irrespective of the method employed, while others prefer to restrict the term to developments of the classical methods.

X-ray analysis can thus be applied for analytical purposes to extremely small amounts of material, and is therefore properly considered as an instrumental method of analysis. It is not so generally agreed, however, whether it can legitimately be regarded as a method of microchemical procedure, since, although the samples which it can handle are within the correct range, the mode of arriving at the solution is completely novel, and in no way derived from classical chemical methods.

Modern Reagents

Modern reagents are generally complicated organic compounds which form highly coloured complexes with organic ions. These complexes are often highly insoluble in water. Care must be exercised in the application of the term "modern reagent" to this class of substance. Two of the best known, α-nitroso-β-naphthol and dimethylglyoxime, have been in use at least 60 and 40 years respectively. Many of them have been developed during the past 20 years, however, and their use has become widespread.

The reagents find use in a number of directions. Spot tests were first devised by Feigl as a microchemical method. A drop of test solution is placed on a piece of absorbent paper, a white glazed tile, or in a small test-tube, and a comparable amount of a reagent added. This will produce an intensely coloured precipitate or solution, if a particular ion is present.

The function of the absorbent paper is to concentrate, by adsorption on the fibres, any precipitate which may be formed. This, if coloured, is the more clearly seen, and hence in such conditions the test is even more sensitive than if performed in orthodox fashion. If a coloured solution, rather than a coloured precipitate, is expected, the spot-plate, against whose white background the colour shows up more vividly, is usually preferred. A greater depth of solution for observation of the colour may be obtained by the use of small tubes.

The limit of sensitivity of these reagents is such that they will frequently indicate as little as five millionths of a gramme of various ions under carefully controlled conditions. Thus, nickel is easily detected by dimethylglyoxime in a concentration of 1:300,000. By the use of a special technique this sensitivity can be increased to 1:3,330,000.

Specific Tests

Much ingenuity has been used in making these tests specific, *i.e.* rendering them positive for one ion and one ion only, and not subject to misleading appearances from the presence of other ions. The dream of the analytical chemist has always been to produce a series of reagents, each of which will be specific for one ion. It is still a distant objective since there are very few truly specific reagents. The dimethylglyoxime test for nickel can be regarded as specific, since the only other ion which will give a precipitate with the reagent is palladium, and the yellow colour of this precipitate prevents it from being confused with the nickel compound.

Although specific tests are few, many tests can be rendered specific within well-defined groups by taking certain precautions. Thus, some ions which give interfering reactions can be tied up by the formation of suitable complexes. If, for example, silver interferes with a test for mercury, it may be possible to prevent this by addition of cyanide to form the $Ag(CN)_2^-$ ion, which will probably then show no reaction.

Spot tests, however, still present many problems. They can be used satisfactorily only for general analysis in conjunction with some well-defined scheme of separation into small groups, within which the tests may be rendered specific. The use of any given spot test in unknown conditions, without provision for possible interferences should be avoided.

So-called crystal tests have been used for about 50 years, but their application could be more widespread. The principle provided

for tests which will produce a precipitate, not necessarily highly coloured, but with a definite crystalline form which can be identified under the microscope. These tests, too, have their limitations. It is, of course, clear that to be able to distinguish two white precipitates by an examination of their crystal forms, without performance of further confirmatory tests, is of considerable advantage.

The bromide and the chloride ion, for instance are distinguishable by this method. While a practised analyist, carrying out a test with silver nitrate in a test-tube, may readily be able to differentiate between the two by the slight variation in colour of their two precipitates, it is less easy to make the distinction when only a drop of solution is available for the test. If, however, the precipitates, which are normally curdy, are allowed to form from ammoniacal solution, well-formed crystals will be obtained. In the case of the two silver halides, these are quite different, as the microscope will soon testify.

Complications can arise from the frequent ability of compounds to form mixed crystals. While a number of ions may be readily identified in simple solution by the use of the reagent ammonium mercuric thiocyanate—this gives characteristic and often highly coloured precipitates with ions such as copper, zinc, cobalt, and cadmium—mixtures of these ions may give rise to precipitates which bear little resemblance to the forms and colours characteristic of the ions when they appear separately. The use of this reagent must consequently be accompanied by a complete knowledge of the possible range of binary, etc., combinations with which the analyst is likely to come into contact. The reagent, which can be very valuable, should otherwise be better avoided.

Quantitive Methods

If a highly insoluble complex is produced by the combination of an organic reagent with an inorganic ion, such a complex is often suitable for use in gravimetric analysis. The relatively large size of most of the organic molecules, and the fact that more than one of the molecules is frequently invovled in formation of the complex, will result in a very favourable conversion factor for the weighed precipitate. In other words, the weight of the precipitate will be large compared with the weight of the ion being determined, and errors in manipulation will be correspondingly of less importance.

While many of the organo-metallic precipitates are suitable for weighing as they are obtained, owing to uncertain composition, or to the difficulty of drying them without risk of decomposition, some of them must be converted by ignition into the oxide. In such a case the method is to be recommended only if the precipitation itself offers advantages over the classical methods. Such advantages as more complete precipitation, less adsorption of impurities, or greater ease of filtration, however, are often sufficient to make an organic reagent commend itself.

Such reagents are usually, though not necessarily, organic. An outstanding exception is the use of zinc uranyl acetate and similar reagents for the precipitation of sodium. The triple acetate, $NaZn(UO_2)_3(C_2H_3O_2)_9.6H_2O$. which precipitates, has a molecular weight of 1507, and each molecule contains only one atom of sodium with an atomic weight of 23. The conversion factor is therefore of the order of $\times$ 70

Colorimetric Analysis

An organic reagent which gives rise to a highly coloured, soluble complex, may prove useful for colorimetric analysis, provided the complex obeys Beer's Law, that " the intensity of absorption of light is proportional to the concentration of the solution," at least over a reasonable range. If a coloured insoluble complex is obtained, it may be converted into a soluble form by a suitable choice of conditions. Or it may be possible to find an organic solvent in which it is soluble. This gives the added advantage that further separations may be achieved by extraction with the organic solvent from aqueous medium.

The coloured solution, prepared under carefully controlled conditions, is compared either with standards similarly prepared, or the depth of colour is measured, perhaps over a limited range of the spectrum cut off by filters, and is related to the concentration of the ion being determined by means of a calibration curve. This field overlaps the apparatus field very considerably, as in recent years, ordinary ocular comparisons of colour have been largely supplanted by instrumental methods.

As in earlier examples, it is unnecessary for the reagent to be organic. Reduction of complex phosphomolybdates and arsenomolybdates by such reagents as stannous chloride, produces a deep blue molybdenum complex which has been widely used for the determination of both phosphorus and arsenic. The ferric thiocyanate complex has similarly offered itself as a means of determining iron. And certain sulphides of analytical Group II have been precipitated in such a condition that their concentration can be compared by the same methods.

A development along similar lines is the indirect estimation of ions. Neither sodium nor potassium, for instance, readily form complexes suitable for colorimetric de-

Education Aids for Physicists

Institute's Widened Services in 1947

THE report for 1947 of the Institute of Physics mentions among the new publications in hand a book of Laboratory and Workshop Notes, the report of a Conference on The Measurement of Stress and Strain and a second edition of the Handbook of Industrial Radiology. The Australian branch has in preparation a report on Physics in Australia and a booklet on Physics as a Career.

Increased interest in the newly-established National Certificates in Applied Physics is mentioned, and the publication of an illustrated booklet on experimental science as a career for the practical boy and girl which was produced by the institute to help in publicising the new certificates.

The membership of the institute continues to grow at a little over 10 per cent per annum and is now about 3250. The institute now has seven branches at home and oversea, and six subject groups, the Stress Analysis Group having been created during the year. All these held many meetings during 1947.

The meetings are open to non-physicists and many engineers, chemists, metallurgists and others have taken advantage of these facilities. The meetings are the principal instrument by which the board implements its policy of demonstrating how the application of physics can assist industrialists.

The report shows that the board has been active in various matters concerning the education and training of physicists and it also refers briefly to more controversial topics, notably the scientist's attitude towards current administration of atomic energy policy (*see* "Notes and Comments").

The institute has concerned itself with professional matters and is represented on the Joint Council of Professional Scientists in which it participates with the Royal Institute of Chemistry, the Institute of Metallurgists and representatives of other sciences. Through its officers it has participated with representatives of other professional bodies in matters of common interest.

DRUG TAX DEPUTATION

THE Chancellor of the Exchequer has been asked to receive representatives of the principal manufacturers of drugs, disinfectants and veterinary medicines, which intends to make representations against the 33⅓ per cent tax proposed in the Finance Bill on such products bearing a branded name or trade mark.

Manufacturers' representatives will point out the grave danger to exports created by penalising branded products. An important export market has been built up, and the 1938 export total of £1,355,000 had been raised to £5,723,000 in 1947. For 1948 a target has been set at £8,500,000.

ANALYSIS—II (*contd. from page 749*)

termination. Potassium may be precipitated as the cobaltinitrite, however, and this in turn can be redissolved, and a colorimetric determination carried out on the cobalt, thus giving a measure of the original potassium content. The triple uranyl acetates, precipitating sodium, may then be used, *via* a colorimetric determination of uranium, to give the required sodium content.

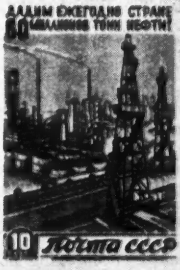
Briefly, reference must be made to the field of indicators which has been greatly extended in the past 20 years. New acid-base indicators have been developed, and the use of both screened and mixed indicators, often utilising and improving on the indicators of classical chemistry, has been considerably extended. Oxidation-reduction titrations have been improved by the introduction of a wide range of internal indicators, so that the laborious use of external indicators is now obsolete. Adsorption indicators, introducing a completely new principle, have been applied to an ever-increasing range of reactions. The problem of titrations in coloured solutions, where ordinary colour indicators are useless, has been partly solved by the introduction of indicators which fluoresce according to the *p*H of the solution. They are therefore called luminescent (or fluorescent) indicators.

The modern analytical chemist, therefore, has infinitely more reagents than his predecessors. Many more, as yet undiscovered, promise a further understanding of the theoretical aspects of analytical chemistry. It should be emphasised, however, that there are many pitfalls for the unwary, the careless, and the semi-trained analytical chemist. As B. L. Clarke has put it, "the analysis of a substance for the limited purpose of determining its composition can be, and frequently is, an operation requiring skill, experience, ingenuity and chemical common sense of a very high order indeed."

(*To be continued*)

Postal Publicity for Petroleum

POSTAGE stamp designs in honour of their petroleum industries have been issued in recent years by all oil producing countries. Shown here (left to right, above) are: Rumania, 3 lei (blue) commemorating the 17th Congress of the General Engineers' Association, 1946; Rumania, 55 lei (blue) in honour of the association's 16th Congress in 1945; Austria, 18g. (sage green), associated with the 1947 Vienna Fair. Left and right: Russia, 1p. (green) issued in 1941; Russia, 10k. (green) inscribed "Give the country 60 million tons of oil a year!" Below, left to right: Colombia, 2c. (red) 1934-5 printing; Colombia, 15c. (black and brown) 1932-9 issue; Chile, 20c. (blue) illustrating the country's nitrate wealth, (1938-40)



Chlorine, Magnesium and Organic Chemicals

U.S. Chemical Engineers Discuss Production Trends

ECONOMIC production of chlorine by non-electrolytic processes, a new source of magnesium which could yield up to 800,000 tons of the metal annually and the necessity for the organic chemical industry to look for new sources of supply to supplement the industry based on coke oven naphthalene and benzene, formed the main subjects of discussion at a regional meeting of the American Institute of Chemical Engineers last week at Cleveland, Ohio.

Economic Considerations

Prof. H. F. Johnstone, University of Illinois, said that research work had advanced to a point where it might be possible to produce chlorine economically by non-electrolytic processes. He recalled that considerable interest in non-electrolytic processes for the production of chlorine developed during the early part of the war because of unprecedented demands and the possibility of shortage of electrical power. A general interest still existed in such a development, due to the economic desirability of divorcing the manufacture of chlorine and caustic now co-produced in the electrolytic process.

"While the demand for caustic at present exceeds that for chlorine, it is the general belief that the market for chlorine will continue to expand even beyond the peak of the war effort," said Prof. Johnstone. "The increased value of by-products and the availability of hydrogen chloride from chlorination processes justify a continuation of development work on non-electrolytic processes."

The most encouraging non-electrolytic process yet developed, he said, was the recently revealed German process described in intelligence reports on the German chemical industry. This process utilised a molten salt mixture as catalyst and recovered the chlorine by absorption in sulphur monochloride. Prof. Johnstone believed this process to be competitive in cost with electrolytic processes at present used in the U.S.A.

New Source of Magnesium

A comparatively new source of magnesium, and the use of it in a form to permit faster volume production of steel in U.S. open hearth furnaces, was revealed by Mr. C. C. Brumbaugh of the Diamond Alkali Co., who said that experience showed that immense deposits of dolomitic limestone close to the surface in Western Ohio could be processed on a commercial scale to produce both lime and magnesium.

The magnesium was a by-product in the production of lime from dolomite, instead of common limestone The large shaft kilns in which the dolomite is burned are lined with bricks made of a form of magnesium that withstands temperatures above 3000°F., Mr. Brumbaugh said. Such super-duty fire bricks withstood even temperatures developed by the new practice of injecting oxygen into steel-making furnaces to increase their capacity.

The estimated 1947 consumption of common limestone by U.S. producers of alkali chemicals, was just under 6½ million tons. If dolomite were used instead, the potential volume of magnesium made available would amount to about 800,000 tons annually. Mr. Brumbaugh also discussed the operation and performance of kilns 80 ft. high and 24 ft. in diameter that burn about 400 tons of crushed dolomite each 24 hours at Diamond's Painesville plant.

Organic Chemical Industry

The twilight stage has been reached in the expansion of the organic chemical industry based on coke oven naphthalene and benzene, said Mr. J. M. Weiss, of John M. Weiss & Co., New York. He added that further substantial growth was dependent on the industry finding new sources of supply, either from petroleum or by the treatment of coal in new ways.

"The supply both of naphthalene and benzene has been dependent almost entirely on the operations of the by-product coke ovens in the steel industry, and in the manufactured domestic gas industry, the naphthalene being obtained mainly from the by-product coke-oven tar, and the benzene from the coke-oven light oil, derived by scrubbing the coke-oven gas," Mr. Weiss said. "The use of coke-ovens in the production of domestic gas has been static or declining over the past two decades, so that the really important source of supplies depends on steel."

"It will be of great interest to watch new developments in coal treatment and in coal by-products which may extend the field of industrial organic chemistry on the basis of raw materials at a price low enough to encourage such developments." In the absence of such developments, coal-based products seemed fated to be of steadily decreasing importance in the field of synthetic organics and the products of petroleum or natural gas were likely to have greater importance, concluded Mr. Weiss.

Industrial Equipment

Chemical and Metallurgical Exhibits

ACTING as a supplement of the industrial and engineering sections of the B.I.F., the Industrial and Engineering Exhibition organised by *The British Bulletin of Commerce* (The Royal Horticultural Hall, Westminster, May 19-28) has provided further opportunities for home and overseas buyers to study specialised equipment. The exhibition will be on view again, with considerable additions to the range of equipment, at the same place in the Autumn (October 11-22 inclusive).

Chemical Storage

While the emphasis centres mainly on the lighter engineering industries, there is on show a considerable amount of material of interest to the chemical engineer, the metallurgist, and chemical factory manager.

Jas. Day Sheet Metal Workers, Ltd., are engaged in the production of storage equipment for all chemical plant using hot or cold processes, manufactured in stainless steel, mild steel, monel, aluminium, copper, etc.

Emerald Welding Co., Ltd., display the "Jeketo" vacuum-type hammermill for grinding a variety of materials. Suction feed automatically provides a steady flow of granular or dusty materials.

Fraser Tuson Products, Ltd., exhibit the "F.T. Floor Scrubber" which applies soap

(*Continued at foot of next column*)

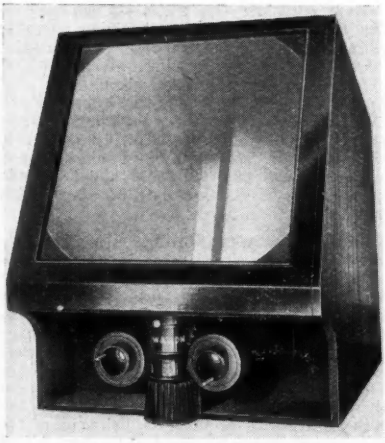
solution to the floor, scrubs it, picks up the used suds, and leaves the floor dry and clean.

Miller & Enfield, Ltd., show a handy electric arc welder capable of being used anywhere, which welds, brazes and solders from a standard 6- or 12-volt battery. Permanent repairs can be effected with iron, steel, brass, copper, tin, galvanised metal, etc.

W. Watson & Sons, Ltd., introduce a microfilm reader, a new self-contained apparatus for examining microfilm negatives or positives in rolls up to 100 ft. long. It projects a sharply defined image on an 18-in. sq. screen and is easily operated.

Equipment for preheating moulding powder is displayed by Radio Heaters, Ltd. Capacity is up to 1½ lb. of powder or preforms, and the plasticising rate up to 55 oz. per minute. Other exhibits include a jig welder for thermo-plastic sheet, and an induction heater for metals.

The Ministry of Supply has a large stand upon which are displayed representative machinery available for sale at various depots. Included are capstan lathes, milling and grinding machines.



The new microfilm reader

Russian Chemical Plant

Aid for Basic Production in Poland

POLISH chemical industry is to receive, according to a statement issued in Warsaw, equipment from the Soviet Union for six factories. Priority is being given to a large nitrate fertiliser plant which will increase production to 150 per cent of pre-war level.

Another plant of great importance to Polish industry is the carbide furnace which is to be installed in the existing factory at Dworu in South-West Poland.

The industry also attaches special importance to the plant for the production of sulphuric acid from anhydride of gypsum. So far, Poland has had to import pyrites in order to produce sulphuric acid.

Increased Deliveries of Chemicals

It is also reported that Poland is to receive more than 500,000 tons of iron ore from the Soviet Union, and more aluminium and chemicals than last year. Other Soviet exports to Poland will include chromium and manganese ores, non-ferrous metals, petroleum products, motor cars, tractors. Additional Polish exports are to be zinc and zinc sheets, cement, railway carriages, iron goods, sugar, chemicals.

Home News Items

Perspex Sheet Prices Reduced.—A reduction of 5 per cent in price of Perspex corrugated acrylic sheet has been made by I.C.I., Ltd. New lists showing the revised prices of different sheet lengths and profiles are now being printed.

Less Coal Raised.—A further heavy reduction last week in coal output was attributed to the slackening caused by the Whitsun holiday. Total production was 3,161,400 tons, compared with 4,182,800 the previous week. To reach the target for the year of 211 million tons, a weekly output of not less than 4,220,000 tons is required.

Prices Stabilised.—The Dynamo and Motor Association, 36, Kingsway, London, W.C.2., announces that, to forward the movement to stabilise prices, it has decided not to increase the present general level of prices of industrial electric motors and dynamos. The present price level has not been changed since March 1947, despite additional costs incurred since then.

Consett Coke Ovens in Production.—The new battery of coke-ovens built by the Consett Iron Co., Ltd., at the Fell Works, County Durham, have produced their first coke. The plant will make 8000 tons of coke a week and in addition 120 million cu. ft. of gas will be available for use at the steelworks. The new ovens form part of a £3 million modernisation plan being carried out by the company.

Ministry Supports Engineering Project.—Authorisation has been granted by the Ministry of Works for the construction of a new steel smelting shop and auxiliary plant, costing £1,722,000, at Hawarden Bridge Steel Works. The project forms part of the company's plan to build a complete new plant which will increase production of steel sheets from 400,000 to 500,000 tons a year.

Farmers' Woollen Factory.—The move by Merionethshire farmers to establish a woollen factory in the county may have far-reaching effects upon the agricultural industry in some of the other North Wales counties. Mr. Thomas Jones, general secretary of the Merionethshire branch of the NFU, has submitted memoranda to the Board of Trade and NFU headquarters in London on the general position. At one time there were 46 woollen factories in Merionethshire, at the time this decision was made to establish at Dinas Mawddy a county woollen factory, which it is hoped will be opened shortly there was only one—at Bleanau Festiniog.

£1000 for Technical College.—Imperial Chemical Industries, Ltd., is subscribing £1000 for the support of full-time intensive courses in chemistry at Bolton Technical College.

£20 M. Loss for N.C.B.?—In a party political broadcast last week the Marquess of Salisbury forecast that the National Coal Board was likely to declare a loss of £20 million.

Surplus Machine Tools.—Since disposals operations began three years ago, 200,000 machine tools to the value of £43 million have been sold by the Ministry of Supply, which still has for sale approximately 20,000 machines stored throughout the country.

Guest, Keen Extension.—Further extensions to the Hillington factory are contemplated by Guest, Keen & Nettlefolds, Ltd., which in 1946, due to the shortage of labour in the Midlands, moved its plant to Scotland. At present, 250 male workers are engaged in producing screws upon a continuous three-shift system.

Aluminium Classrooms.—Shortage of other building materials needed for the erection of a new junior secondary school at Kaimhill, Aberdeen, has compelled the local education committee to substitute eight aluminium classrooms as a temporary measure. The units, together with auxiliary accommodation, will cost about £36,000.

New Yorkshire Gas Plant.—A contract for the erection of a new carbonising plant at Skinningrove, Yorkshire, for the Skinningrove Gas Company has been given to J. W Jenkins and Co., Ltd., Retford, and the piled foundation work will be done by the F. C. Construction Company, Derby. The new plant is necessary owing to the growing demand in the area for gas both for domestic and industrial use and will cost about £80,000 to complete. A starting date for its erection has not yet been fixed.

I.C.I. Employees' Outing.—Upon what is claimed to be the largest single workers' excursion ever attempted, 2000 employees of I.C.I. (Explosives Division), Ardeer, sailed in two specially chartered steamers to Rothesay last week. Practically the entire catering facilities of the holiday town were mobilised to cater for the visitors and a similar large party was due to be taken there yesterday. The visits celebrate the 50th anniversary of the establishment of the explosives industry at Ardeer by Alfred Nobel in 1898.

American Chemical Notebook

From Our New York Correspondent

SUPERIOR laboratory glassware, made from a new type of heat-resistant material, has recently been developed by Corning Glass Works engineers. The new glass, called Vycor, developed by Dr. Martin Nordberg and Harrison Hood, of Corning Glass, can be heated to 1800°F. and rapidly cooled without breaking. Sun lamps made from Vycor are said not to darken and lose their potency as rapidly as lamps containing other kinds of glass. The glass consists almost entirely of silica, or quartz. Fused silica has long been used because it is heat-resistant and does not impede the passage of ultra-violet light. Vycor may take the place of quartz glass, since it is cheaper to manufacture and easier to shape. It is made from a soft, alkaline glass, which can be moulded or blown by conventional methods. The soft glass is then immersed in hot acid and the alkali dissolved and washed out. This treatment leaves a porous material, consisting of fine glass filaments interlaced in a complex network. When the glass is heated to 2000°F. the pores close and the glass shrinks to two-thirds its volume. The final product can be used continuously at a temperature of 1600°F. without losing its strength or clearness, but if it is heated to more than 1800°F for prolonged periods, it becomes cloudy and opaque upon cooling. The opacity, however, does not effect the strength of the glass.

* * *

The Office of International Trade has partially raised export controls on four potassium chemicals which have been placed on general licence for export to country "O" destinations—everywhere but Europe. The four chemicals affected are: potassium nitrate; potassium nitrate mixtures except potassium nitrate powders (black saltpetre powder); technical grade potassium sulphate; and technical grade potassium chloride.

* * *

Officials of the Elliott Company, a Pennsylvania power plant producing concern, claim that a new method of large scale oxygen production developed by the firm will, when finally incorporated in special plant now being built for the purpose, make possible a minimum daily output of 25 million cu. ft. of oxygen. In the new process, pre-conditioned air is cooled to 300°F. below zero (minus 184.4°C.), and distilled into nitrogen and oxygen which can be piped directly to the point of use. No periodic breaks for "de-frosting" are needed, and explosion danger is said to be greatly reduced. Oxygen blowing in open hearths, blast furnaces, Bessemer converters, and electric furnaces has been found to increase steel output by a substantial margin and in another major application under test for synthetic oil production, the new oxygen process "would make the U.S.A. independent of foreign supply of liquid fuels for 1000 years," claimed a company official.

* * *

The U.S. Atomic Energy Commission has announced two additional payments for deliveries of carnotite- or roscoelite-type uranium bearing ores from the Colorado plateau area. The increased payments are for haulage and an allowance of 50 cents per lb. of uranium oxide (U_3O_8) contained in ores assaying 0.20 per cent. or more U_3O_8, which is intended to stimulate reopening and equiping closed mines and increasing the production facilities of mines now operating.

* * *

The report for 1947 issued by the Standard Oil Co. (N.J.) makes reference to the following major construction projects:—expansion of plant at the Baton Rouge refineries, work on a new $21 million refinery at Billings, Montana, and removal of the Canadian Whitehorse refinery to Edmonton (a distance of 1350 miles), to refine crude oil from the promising Leduc field. The modernisation of the plant at Montreal East will be completed this summer, when refining capacity will be raised to some 14,000 barrels a day. The new refinery at Amuay, Venezuela (daily capacity 60,000 barrels), is to be completed late in 1949.

* * *

Output of primary aluminium in February totalled 45,699 short tons, a decline of 6 per cent from the 48,767 tons produced in January, according to the monthly report of the U.S. Bureau of Mines. The decrease was due entirely to the shorter month, however, as the average daily rate of production remained virtually unchanged. Production was still limited by availability of electric power, though it was noted at the end of the month that some plants were to receive additional power during March. Production was again lower than shipments and use, and stocks of pig aluminium at primary reduction plants declined for the seventh successive month to a new low level of 9354 tons.

India's Future Coal–Oil Industry

From Our Own Correspondent

THE proposed Electro-Chemical Research Institute is to be located at Karaikudi in the Madras Presidency. Dr. Alagappa Chettiar, who has already given Rs.1.5 million to the institute, is also to provide 300 acres of land in Karaikudi.

At the recent annual meeting of the Indian Mining Federation in Calcutta, Dr. S. P. Mookerjee said he entirely agreed with the observations of the Indian Coalfields Committee about the need for conserving good metallurgical coal. Asked if the Government was contemplating the establishment of a plant for the production of power alcohol, Dr. Mookerjee said that although they had not formulated a definite scheme, they were examining the possibility of producing synthetic oil from coal. The quality of oil they could produce depended on many factors. They had been told by experts that the kind of coal from which this oil could be made was plentiful in India.

It had been decided to bring out certain experts from the U.S.A. who would be associated with experts from Germany. They were expected to arrive in India in the course of the next few weeks. A report would be called for on the basis of production of one million tons of synthetic oil, and an alternative report on the basis of half or a quarter million tons.

Development of Soap Industry

At the first South Indian Soap Makers' conference, held in Calicut, Mr. P. B. Kurup, chairman of the reception committee, said despite the fact that South India was the largest producing centre of coconut and groundnut oils in India, and owned the one factory producing solid caustic soda, it was not self-supporting in the matter of soap. By united efforts and by bettering the supply position of raw materials, soap manufacturers in South India would soon be able to convert the area into a surplus one.

Mr. K. M. Menon, Minister for Agriculture, asked why they should not use groundnut oil for soap manufacture as it was cheaper than coconut oil. It was part of the Indian Congress programme that soap making should be a cottage industry. He wanted every factory to conduct research work, and as they now depended on foreign countries for caustic soda, they should take steps to manufacture it in large quantities in India.

Changes in the regulations governing imports of soda ash into India are quoted by the *Board of Trade Journal*, which states that the Import Trade Controller, Calcutta, has issued a notice that during January-June, 1948, licences for the import of soda ash will be freely granted by the Chief Controller of Imports, New Delhi, provided applicants produce definite evidence that they can import the quantity applied for at a c.i.f. value not exceeding Rs.400 per ton of 2240 lb. These licences will be valid only for imports made at or below the c.i.f. price specified in them. The importers will not be allowed to open letters of credit or make remittances at a price in excess of that specified in the licence and customs clearance will not be granted without adequate evidence to show that the goods are imported at or below the c.i.f. price referred to in the licences.

Revision of Tariffs

It is also reported that the Government of India has requested the Tariff Board to examine in detail the question of protection now enjoyed by the following industries and to report what protective measures, if any, should be continued after March 31 next year :—

Magnesium chloride, sericulture, artificial silk and cotton, mixed fabrics, silver thread and wire (including so-called gold thread and wire mainly made of silver) and silver leaf, including also imitation gold lametta and metallic spangles and articles of a like nature, of whatever metal made, fabrics containing gold or silver thread, and sugar.

Canadian Pest Control

The Canadian Department of Agriculture, backed by Canadian chemical industries, is to commence a drive to alleviate the tremendous annual damage caused by pests to public health, crops and property. Canadian statistics showed that effective pest control would amount to a saving of more than $400 million a year.

Mr. Wm. MacLean, Naugatuk Chemical Division of the Dominion Rubber Co., Ltd., who has been elected chairman of the drive, states that modern research disclosed that more than 20 communicable diseases, possibly including poliomyelitis, were carried by the common house fly. Technical advice will be drawn from experts in the chemical field and entomological services.

Overseas News Items

Austrian Blast Furnaces.—The lighting of a second blast furnace at the large Linz iron works increases to four the number of units working in Austria.

Canada's Nickel Output Rising.—Canada's nickel output is now running at a monthly rate of about 22 million lb. and it is anticipated that output for the current year will amount to about 260 million lb. (236 million lb. in 1947).

Australian Tantalite for Britain.—By a decision of the Australian Department of Commerce, tantalite and tantalum exports are to be reserved for Britain. The Belgian Congo is the source of supply for the U.S.A.

U.S. Commodity Control.—The retention of controlled distribution until February 1949 of tin and tin products, antimony, quinidine and cinchona bark and nitrogenous fertilisers is proposed in a Bill recently introduced into the U.S. House of Representatives.

German Iron-ore Deposits. — Iron-ore deposits have been discovered at a depth of 1200 metres in the Siegerland region of the British-American zone. Iron-ore had been mined in this region for a considerable time, but it had so far been assumed that an exploitation of deposits found deeper than 1000 metres was not economical.

Iron Sand Tests.—Iron sands mined on North Island, New Zealand, are to be tested by British and Norwegian experts in a plant established by the Government at Onekaku towards the end of this year. The difficulty in separating the titanium from the iron ore is said to be overcome by the employment of electrical furnaces.

Copper and Brass Sufficiency.—It has been announced from Delhi that India is now self-sufficient in copper and brass alloys, rods and bars, and that strip and sheet requirements may soon also be met from home production. This self-sufficiency, however, is limited to semi-manufactured products, and virgin metal has still to be imported.

Italian Linoleum Production.—During 1947 over 400,000 kg. of linoleum were exported from Italy, principally to the Scandinavian countries, Poland and Czechoslovakia. Output per month, mainly as a result of a continuous flow of orders from the automobile industry, has now reached about 350,000 kg. and more varieties of linoleum are being produced. Several factories are being adapted for the manufacture of linoleum from synthetic woods.

Sierra Leone Ilmenite. — Interest has recently centred on the Sierra Leone ilmenite deposits, located near Freetown. It is reported that the possibility of their exploitation is being studied.

British Company's Nitrate Concession.—The British-owned Lautaro Nitrate Company has received authorisation of the Chilean Ministry of Finance for the exploitation of a new potash deposit in Northern Chile.

German Lead Mines Active.—After three years of inactivity, work has recently been resumed in the Eifel (Western Germany) lead mines, operated by the Mechernich company. An annual output of some 7000 tons of lead is expected.

S.A. Electric Power Transfer.—The South African Electricity Supply Commission is to take over control of the power undertaking of Victoria Falls and Transvaal Power Company on July 1, at a purchase price of £14.5 million.

Dutch Production Level.—Figures published by the Netherlands Central Statistical Bureau indicate that the production index figures for March (1938 = 100) for certain important chemical products were as follows:—benzol products 175; phosphate fertilisers 180; nitrogenous fertilisers 82 and sulphuric acid 73 (in February). Annual averages for these products in 1947 were:—126, 131, 67 and 66.

Chilean Fertiliser Developments.—An electrolytic plant for refining copper is to be built at Coquimbo, Chile. The nearby Juan Soldado cement plant will be taken over by the Fàbrica de Cemento El Melòn, S.A., and if this amalgamation takes place it appears probable that a large part of that factory would be converted to the production of phosphate fertiliser. Another phosphate plant is being erected in the same locality, and plans include the construction of a pier in Guayacàn Bay to serve both factories.

New Spanish Companies.—Among companies recently registered in Spain are: Industrias Quimicas Reunidas, S.A., (Inquiresa), Barcelona, the object of which is the manufacture of 120 tons per annum of activated carbon. Resinas Industriales, S.A., Barcelona, plans to produce annually 35,000 kilogrammes of synthetic resins. Francisco Montplet Prunes, Barcelona, will produce an unspecified quantity of dielectric phenolic resins and the manufacture of physical apparatus (1500 units per annum), is to be taken up by Morates-Rovira, also of Barcelona.

PERSONAL

MR. L. P. KENT has been appointed an alternate director (to Mr. S. G. Mewell) of Anglo-Alpha Cement, Ltd., in succession to Mr. J. Hare.

MR. E. H. BALL, managing director of the British Thomson-Houston Co., has been elected a director of Associated Electrical Industries, Ltd.

MR. NOEL F. NEWSOME has resigned his directorship of public relations, National Coal Board. He will shortly take up the appointment of public relations officer to Harry Ferguson, Ltd., tractor manufacturers.

MR. B. H. DINGLEY is going to Batavia as manager of the Dunlop Rubber Company's office there, leaving the accounts section of the overseas department at St. James's House where he has been a senior assistant since 1945.

MR. GEORGE H. TOMLINSON, vice-president of Howard Smith Paper Mills, Ltd., has been awarded the medal of the Society of Chemical Industry (Canada), which is presented every two years for outstanding contributions to the Canadian chemical industry.

DR. RICE WILLIAMS (advisory chemist) is one of the team of experts who will work at the newly opened research station, Crosswood Mansion, Cardiganshire, previously owned by the Earl of Lisburne, and which will be the headquarters of the National Agricultural Advisory Service.

SIR FREDERICK BAIN, president of the FBI, has left by air for Canada where he spoke at the invitation of the Canadian Manufacturers' Association at the association's annual general meeting dinner at Toronto. He has also accepted an invitation to attend the official opening to-day of the Canadian International Trade Fair at Toronto. Sir Frederick Bain will visit Washington and return home in mid-June.

DR. JOSEPH TAIT, resident secretary for Scotland of the Pharmaceutical Society, who made his last official appearance prior to retirement at an annual meeting of the society last week, received a tribute from Mrs. Jean K. Irvine, the president. She said: "For over 50 years Dr. Tait has served the society faithfully and well. We are grateful to him for all he has done for pharmacy, particularly in Scotland, where the liaison he has established with the Department of Health for Scotland has been most valuable."

MR. F. E. BARROWS, a member of the New York patent law firm of Pennie, Edmonds, Morton, and Barrows, is the new president of the Chemists' Club, of New York.

DR. JOSEPH NEEDHAM, head of the Natural Science Section of Unesco, has relinquished that post to resume at Cambridge University his study of the history of science and technology in the Far East.

MR. W. FINLAY MCINTOSH, a sales executive of the home sales staff of Glaxo Laboratories, Ltd., Greenford, left England recently by BOAC flying boat on a business visit of several months to Glaxo's subsidiary company in New Zealand.

MR. ARTHUR FRANKS, who has been chairman of the Oil Distributors Emergency Council since its inception at the outbreak of the war, was the guest of honour at a luncheon given by members of the council in London last week and was presented with a portrait in oils of himself by Mr. James Gunn.

MR. HARRY DAVIES, secretary of the local branch of the Transport and General Workers Union, has been presented with the British Empire Medal at the Ruabon works of Monsanto Chemicals, Ltd. The award, presented by SIR PERCY THOMAS, chairman of the Welsh Board for Industry, was made for outstanding services in the forwarding of industrial relations in the chemical industry, particularly during the war years.

SIR JAMES CHADWICK, professor of physics at the University of Liverpool, confessed to being "completely stumped" by the curriculum taken by students of the Physiotherapy School of the Royal Liverpool United Hospital, when he distributed the Chartered Society Certificates and Royal Southern prizes at Radiant House, Liverpool. If he had his time over again, he confessed, he would like to combine physics with medicine. "But after looking at your formidable examination papers, I don't think I'd attempt physiotherapy," he said.

Obituary

SIR MURRAY MORRISON, deputy chairman and for 15 years managing director of the British Aluminium Co., Ltd., has died in London, aged 74. Largely responsible for the development of the aluminium industry and for the associated hydro-electric work in the Scottish Highlands, he was also a pioneer in the production of aluminium in Norway.

Recognition for Scottish Steel Drive

Sir S. Cripps on Plant Replacement Prospects

ADDRESSING members of the Glasgow Chamber of Commerce last week, Sir Stafford Cripps said we had reached a time when the further stages of increasing production for export were much less easy. Sales resistance was building up; we had almost reached the limit of raw material supplies, particularly in certain important commodities such as steel, and there was no more, or very little more, to come back into the labour market.

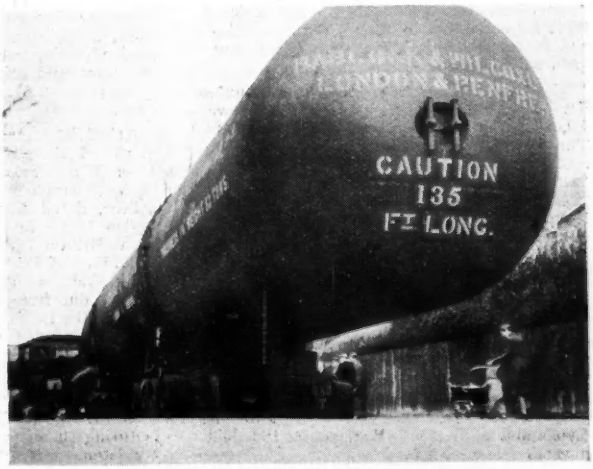
Dealing with Scotland's contribution to the production drive, Sir Stafford said that Scotland had increased her share of pig-iron production from 6 per cent to 8 per cent in the first quarter of 1948, and to do that she had expanded her output by nearly three-quarters from 7900 tons per week to 13,700 tons. In steel ingots and castings she had maintained her percentage of 15 per cent of the total production for the country. That was a good record, but it could and would be improved upon when plants were modernised and balanced, and some of the very old plants replaced by new and up-to-date ones.

There were some prospects of immediate improvement in that direction and also some very large-scale proposals that would require a little more time to implement in view of the difficulty in finding the resources for the capital investment programme of which Scotland would have its full share.

MAMMOTH AIR BOTTLE FOR N.P.L.

AN 83-ton air-bottle left the premises of Babcock & Wilcox, Ltd., Renfrew, on May 23, for delivery to the National Physical Laboratories at Teddington, Middlesex, a distance of 463 miles. The journey will take 10 days, and the air-bottle, which is being delivered to the order of the Ministry of Works, is being transported on two 16-wheeled bogeys hauled by a tractor. This is the second such air-bottle to have made the journey.

The dimensions of the vessel are 9 ft. 9 in. in dia. by 79 ft. 6 in. long by 1¾ in. thick. In discussion with THE CHEMICAL AGE, Mr. Thos. Lavender, chief engineer at the National Physical Laboratories, said the bottle is to be used as a storage vessel for air up to a pressure of 350 lb. p.s.i., and will be used for research work in high speed (supersonic) and compressed air wind tunnels. Its installation reflects the increased need for air-storage capacity for this class of work.



Impressive close-up of the first air-storage vessel which recently made the journey from Renfrew, Scotland, to the National Physical Laboratories at Teddington. An identical vessel is now making the same 10-day journey over a specially reconnoitred route to the same place

Company News

The nominal capital of **Servisol, Ltd.**, 14 North John Street, Liverpool, has been increased beyond the registered capital of £100 by £7400, in £1 ordinary shares.

The name of **Loganite Products, Ltd.**, chemical manufacturers, etc., 261 Boston Road, London, W.2. has been changed to **Loganite Enterprises, Ltd.**, as from May 4, 1948.

The nominal capital of **Northern Glass and Instruments, Ltd.**, 25 John Street, Sunderland, has been increased beyond the registered capital of £5000, by £10,000 in £1 ordinary shares.

Evans Medical Supplies, Ltd., reports a net profit of £41,197. A payment of 7.023 per cent is proposed on the cumulative participating preference stock, and a payment of 10 per cent on the ordinary stock.

Glyn Mills and Co., the British trustee, announces that the half-yearly interest payment on the **Chilean Nitrate and Iodine Sales Corporation** 5 per cent. sterling income debentures will be made on June 30 at the full rate of 2½ per cent less tax.

The Chloride Electrical Storage Co., Ltd., reports a net profit for the year just ended of £317,940, compared with £326,158 for the previous year. A dividend of 6 per cent has been declared on the preference stock, and 5 per cent plus a bonus of 10 per cent on the "A" and "B" ordinary stocks.

Etablissements Kuhlmann, one of France's leading chemical groups, reports a net profit for 1947 of 114.5 million francs (57.5 million francs in 1946), out of which a gross dividend of 40 francs (same) is being declared. This rate is equal to 10 per cent (same) on the increased capital of 1098 million francs (549 million francs).

The operating profit of the whole **Dunlop Rubber Company** group for 1947 was £9,426,396 as against £8,263,279 for 1946. The Dunlop parent company made a record profit of £4,652,506, £743,320 more than in 1946. £1,714,906 of this has been set aside for taxation. A dividend of 12 per cent. with a bonus of 3 per cent., the same as last year, is recommended on ordinary stock.

New Companies Registered

J. K. Lyons, Ltd. (452,489).—Private company. Capital £500. To acquire the business carried on by Mrs. A. Lyons at 182 Coldharbour Lane, S.E.5, and to carry on the business of manufacturing, dispensing and general chemists, etc. Directors: A. Lyons and J. Carson. Reg. office: 182 Coldharbour Lane, S.E.5.

Thawpit (Ireland), Ltd. (12,409).—Private company. Capital £20,000. Chemists, druggists, drysalters, oil and colourmen, manufacturers importers and exporters of cleansers and synthetic detergents of all kinds, etc. Subscribers: A. Warner, 31 Castle Street, Dublin; A. Clear.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for errors that may occur.

Mortgages and Charges

(Note.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described herein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every company shall, in making its Annual Summary, specify the total amount of debt due from the company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.)

MULA (CHEMICALS) LTD., Birmingham. (M. 29/5/48). April 16, charge, to District Bank Ltd., securing all moneys due to or to become due to the Bank; charged on Idlicote-ho. and Whitehouse Farm, Idlicote. *—. June 19, 1947.

ALUMILITE AND ALZAK LTD., London, W. metallurgists and engineers (M. 29/5/48). April 14, debtors to Martins Bank Ltd., securing all moneys due or to become due to the Bank; general charge. *£10,000. December 15, 1947.

WELSH METAL INDUSTRIES LTD., Birmingham. (M. 29/5/48). March 29, £137,000 (not ex.) debtor to H.M. Treasury Solicitor; charged on land at Beddau, Elgwysilan, Caerphilly, with buildings thereon and land adjoining same (subject to an exception of mines and minerals) and general charge subject to etc.). *£96,531. December 31, 1947.

AIRMEC LABORATORIES LTD. (formerly P.R.T. LABORATORIES LTD.), High Wycombe. (M. 29/5/48). April 13, charge, supplemental and collateral to a debtor, dated August 16, 1939, executed by Philco Radio and Television Corporation of Great Britain Ltd., having changed its name to Radio and Television Trust Ltd., to Lloyds Bank Ltd., securing all moneys due or to become due from Radio and Television Trust Ltd., to the Bank; charged on Cressex Works, High Wycombe, with fixtures, fixed plant, etc., and general charge. *Nil. January 13, 1948.

Receivership

ANTISEPTIC PRODUCTS, LTD., manufacturing chemists, etc., 105 Tonbridge Road, Maidstone. (R. 29/5/48). Mr. Stanley F.

Wilson, F.C.A., 15 Cullum Street, E.C.3., was appointed receiver and manager on April 30, 1948, under powers contained in debenture dated September 1, 1945.

Chemical and Allied Stocks and Shares

THERE has again been little broadening of stock market business, but, with British Funds showing further gains on balance, the tendency generally has been firm. The knowlege that many important new issues are bing made acted as a competitive influence.

If market assumptions are correct, Imperial Chemical's new issue may raise over £40,000,000 by offering to ordinary stockholders two new £1 ordinary shares at 45s. each for every five held. This would be one of the biggest industrial issues ever made and would be larger than the big share offer made by Shell Transport a few months back. Awaiting terms of the share issue, Imperial Chemical have eased to 48s. 6d. at the time of writing.

Elsewhere, Monsanto Chemical strengthended to 61s. 3d., while Dunlop Rubber at 74s. 6d. improved in anticipation of the full report. Business up to close of 32s. was recorded in Albright & Wilson 5s. shares, and Amber Chemical 2s. shares were 10s. 4½d. William Blythe 3s. shares continued their upward trend, changing hands up to 19s. 7½d. In other directions, Burt Boulton & Haywood have realised 28s., and W. J. Bush were 85s., Laporte Chemicals 21s. 3d. and the new shares 2s. 4½d. premium.

British Aluminium at 51s. have been firm, and British Oxygen strengthened further to 100s. 7½d., while Borax Consolidated held their recent rise to 63s. 1½d. British Glues & Chemicals at 23s. 3d. remained firm, but awaiting the dividend announcement, British Match were easier at 40s. 6d.

Iron and steels held firm—Dorman Long 32s. 6d., United Steel 30s. 1½d., while Colvilles rose further to 36s., reflecting the statement in the recent annual report that more capital may be required, which it is assumed in the market might take the form of an offer to existing shareholders. Guest Keen strengthened to 50s. 9d. on the decision to exchange debentures into preference shares. The market was interested in the company's decision to become wholly a holding concern and transfer its varied activities to operating subsidiaties. This course, the directors feel, would simplify problems that would arise in the event of iron and steel naionalisation.

United Molasses eased to 51s. 4½d. following publication of the annual statement which emphasises the large sums that have to be provided for new tanker tonnage. The units of the Distillers Co. have been firm at 28s. 9d., Associated Cement have been steady at 73s. 9d., and British Plaster Board 24s. 10½d. Glaxo Laboratories have firmed up to £17¾, British Drug Houses 5s. shares were 12s. 3d., and Boots Pure Drug 53s. 3d.

Triplex Glass 10s. shares at 25s. 9d. have shown little movement. It is realised that dividend limitation will prevent a higher payment for shareholders for the time being, although it is being assumed that profits are probably running at an increased level, partly owing to growth in export trade, to which the directors referred earlier in the year. In other directions, Beechams deferred were 21s. 6d., Timothy Whites 41s. and Sangers 35s. 9d.

Oil shares remained active, but did not hold all earlier gains, the tendency having been to await developments in Palestine. Anglo-Iranian changed hands over £9 and Shell strengthened to 81s. 10½d. The Shell preliminary statement is expected on June 7 and the market assumes it will show a sharp increase in profits. The dividend, however, will be kept at 7½ per cent., tax free, in accordance with the previous official estimate, the new shares now ranking for the final payment.

GAS TURBINE SCHOOL

THE first of nine courses to be held this year at the School of Gas Turbine Technology, Lutterworth (the only one of its kind in the world), will be held on Monday next, when U.K. and Dominion commercial technicians will attend for three weeks' instruction in the industrial uses of the gas turbine. Responsibility for all arrangements rests with Power Jets (Research & Development), Ltd., a company owned by the Ministry of Supply. The students will learn basic theory, practical testing procedure, and instrumentation. A series of lectures will be given by specialists in subjects such as fuel problems, application in locomotives and marine installation, metallurgy and combustion components.

So far, 800 British and 35 foreign engineers have passed through this institution. There is a limited number of vacancies still remaining to be filled.

Courses have been divided into four categories: industrial, aero engine, draughtsmens' and international. The international course will be held in August and will be a combination of the industrial and aero-engine syllabuses.

Prices of British Chemical Products

STEADY trading conditions have again been reported on the chemicals market and contract deliveries to the chief consuming industries have been on a good scale. New business for prompt or short delivery dates continues to be difficult to place for some items, while in other directions the supply position appears sufficiently improved to take care of a persistent export inquiry. All sections of the market display a firm undertone and no actual price changes have been reported on the week. The demand for the coal tar products remains strong and offers find a ready outlet. Prices for home trade are unaltered.

MANCHESTER.—Following a week's lull in business on the Manchester chemical markets, a resumption of active trading has been reported during the past few days. The Lancashire textile bleaching, dyeing and finishing trades are calling for larger deliveries of the alkalis and a wide range of other chemical products, both light and heavy, and a steady movement of supplies is also proceeding to the other leading industrial outlets. Superphosphates, sulphate of ammonia, and the compound manures are among the active sections of the fertiliser market. In the tar products section, steady pressure for deliveries of the principal light and heavy materials has been resumed.

Price Changes

Rises: Ammonium carbonate, bleaching powder, calcium chloride, liquid chlorine, formaldehyde, formic acid, oxalic acid, salicylic acid, and pyridine.

Reductions: Ammonium bicarbonate, sodium acetate, sodium nitrite, and sodium percarbonate.

General Chemicals

Acetic Acid.—Maximum prices per ton: 80% technical, 1 ton, £64; 80% pure, 1 ton, £66; commercial glacial 1 ton £79; delivered buyers' premises in returnable barrels: £4 10s. per ton extra if packed and delivered in glass.

Acetic Anhydride.—Ton lots, d/d, 11¾d. per lb.

Acetone.—Maximum prices per ton, 1/5 tons, £76 10s.; single drums, £77 10s.; delivered buyers' premises in returnable drums or other containers having a capacity of not less than 45 gallons each. For delivery in non-returnable containers of 40/50 gallons, the maximum prices are £3 per ton higher. Deliveries of less than 10 gallons free from price control.

Alcohol, Industrial Absolute.—50,000 gal. lots, d/d, 2s. 7¼d. per proof gallon; 5000 gal. lots, d/d, 2s. 10¼d. per proof gal.

Alum.—Loose lump, £16 per ton, f.o.r. MANCHESTER: £16 10s.

Aluminium Sulphate.—Ex works, £11 10s. per ton d/d. MANCHESTER: £11 10s.

Ammonia, Anhydrous.—1s. 9d. to 2s. 3d. per lb.

Ammonium Bicarbonate. — MANCHESTER: £40 per ton d/d.

Ammonium Carbonate.—£48 per ton d/d in 5-cwt. casks. MANCHESTER: Powder, £50 d/d.

Ammonium Chloride. — Grey galvanising, £22 10s. per ton, in casks, ex wharf. Fine white 98%, £21 to £25 per ton. See also Salammoniac.

Ammonium Nitrate.—D/d, £18 to £20 per ton.

Ammonium Persulphate.—MANCHESTER: £5 per cwt. d/d.

Ammonium Phosphate.—Mono- and di-, ton lots, d/d, £78 and £76 10s. per ton.

Antimony Oxide.—£162 10s. per ton.

Antimony Sulphide.—Golden, d/d, as to quantity, etc., 4s. to 5s. per lb.

Arsenic.—Per ton, £40 5s. to £41 5s., according to quality, ex store.

Barium Carbonate.—Precip., d/d; 2-ton lots, £25 15s. per ton, bag packing, ex works.

Barium Chloride.—98/100% prime white crystals, 5-ton lots, £26 per ton, bag packing, ex works.

Barium Sulphate (Dry Blanc Fixe).—Precip., 4-ton lots, £26 10s. per ton d/d; 2-ton lots, £26 15s. per ton.

Bleaching Powder.—Spot, 35/37%, £18 10s. per ton in casks, special terms for contract. £24 15s. in 1-cwt. drums.

Borax.—Per ton for ton lots, in free 1-cwt. bags, carriage paid: Commercial, granulated, £30; crystals, £31; powdered, £31 10s.; extra fine powder, £32 10s. B.P., crystals, £39; powdered, £39 10s.; extra fine, £40 10s. Borax glass, per ton in free 1-cwt. waterproof paper-lined bags, for home trade only, carriage paid: lump, £77; powdered, £78.

Boric Acid.—Per ton for ton lots in free 1-cwt. bags, carriage paid: Commercial, granulated, £52; crystals, £53; powdered, £54; extra fine powder, £56. B.P., crystals, £61; powder, £62; extra fine, £64.

Calcium Bisulphide.—£6 10s. to £7 10s. per ton f.o.r. London.

Calcium Chloride.—70/72% solid, £9 7s. 6d. per ton, ex store.

Charcoal, Lump.—£25 per ton, ex wharf. Granulated, £30 per ton.

Chlorine, Liquid.—£29 per ton, d/d in 16/17-cwt. drums (3-drum lots).

Chromotan.—Crystals, 5⅝d. per lb.

Chromic Acid.—1s. 10d. to 1s. 11d. per lb., less 2½%, d/d U.K.

Citric Acid.—Controlled prices per lb., d/d buyers' premises. For 5 cwt. or over, anhydrous, 1s. 6¾d., other, 1s. 5.; 1 to 5 cwt., anhydrous, 1s. 9d., other, 1s. 7d. Higher prices for smaller quantities.

Cobalt Oxide.—Black, delivered, 6s. 7d. per lb.

Copper Carbonate.—MANCHESTER: 1s. 8d. per lb.

Copper Chloride.—(53 per cent), d/d, 1s. 10d. per lb.

Copper Oxide. — Black, powdered, about 1s. 4½d. per lb.

Copper Nitrate.—(53 per cent), d/d, 1s. 8d. per lb.

Copper Sulphate.—£42 10s. per ton f.o.b., less 2%, in 2-cwt. bags.

Cream of Tartar.—100%, per cwt., from 201s. to 205s. per cwt. lots, d/d.

Ethyl Acetate.—10 tons and upwards, d/d, £115 per ton.

Formaldehyde.—£31 per ton in casks, according to quantity, d/d. MANCHESTER: £31 to £32.

Formic Acid.—85%, £64 per ton for ton lots, carriage paid. 90%, £67 5s. per ton.

Glycerine.—Chemically pure, double distilled 1260 s.g., 123/1 per cwt. Refined pale straw industrial, 5s. per cwt. less than chemically pure.

Hexamine.—Technical grade for commercial purposes, about 1s. 4d. per lb.; free-running crystals are quoted at 2s. 1d. to 2s. 3d. per lb.; carriage paid for bulk lots.

Hydrochloric Acid.—Spot, 7s. 6d. to 8s 9d. per carboy d/d, according to purity, strength and locality.

Hydrofluoric Acid.—59/60%, about 1s. to 1s. 2d. per lb.

Hydrogen Peroxide.—1s. 0½d. per lb. d/d, carboys extra and returnable.

Iodine.—Resublimed B.P., 10s. 4d. to 14s. 6d. per lb., according to quantity.

Iron Sulphate.—F.o.r. works, £3 15s. to £4 per ton.

Lactic Acid.—Pale tech., £75 per ton; dark tech., £65 per ton ex works; barrels returnable.

Lead Acetate.—White, 110s. to 115s. per cwt., according to quantity.

Lead Carbonate.—British dry, ton lots, d/d, £116 per ton.

Lead Nitrate.—About £115 per ton d/d in casks. MANCHESTER: £115.

Lead, Red.—Basic prices per ton: Genuine dry red lead, £106; orange lead, £118. Ground in oil: red, £132; orange, £144. Ready-mixed lead paint: red, £140; orange, £152 (subject to increase of £1 10s. per ton).

Lead, White.—Dry English, in 8-cwt. casks, £116 10s. per ton. Ground in oil, English, in 5-cwt. casks, £141 per ton.

Lime Acetate.—Brown, ton lots, d/d, £18 to £20 per ton; grey, 80-82 per cent, ton lots, d/d, £22 to £25 per ton.

Litharge.—£103 10s. to £106 per ton.

Lithium Carbonate.—7s. 9d. per lb. net.

Magnesite.—Calcined, in bags, ex works, £18 5s.

Magnesium Carbonate.—Light, commercial, d/d, £70 per ton.

Magnesium Chloride.—Solid (ex wharf), £27 10s. per ton.

Magnesium Oxide.—Light, commercial, d/d, £160 per ton.

Magnesium Sulphate.—£12 to £14 per ton.

Mercuric Chloride.—Per lb., for 2-cwt. lots, 7s. 6d.; smaller quantities dearer.

Mercurous Chloride.—8s. 10d. to 9s. per lb., according to quantity.

Mercury Sulphide, Red.—Per lb., from 10s. 3d. for ton lots and over to 10s. 7d. for lots of 7 to under 30 lb.

Methanol.—Pure synthetic, d/d, £28 to £38 per ton.

Methylated Spirit.—Industrial 66° O.P. 100 gals., 4s. 10d. per gal.; pyridinised 64° O.P. 100 gal., 4s. 11d. per gal.

Nickel Sulphate.—F.o.r. works, 3s. 4d. per lb.

Nitric Acid.—£24 to £26 per ton, ex works.

Oxalic Acid.—£128 to £133 per ton packed in free 5-cwt. casks.

Paraffin Wax.—Nominal.

Phosphoric Acid.—Technical (S.G. 1.500), ton lots, carriage paid, £61 per ton; B.P. (S.G.1.750), ton lots, carriage paid, 1s. 1½d. per lb.

Phosphorus.—Red, 3s. per lb. d/d; yellow, 1s. 10d. per lb. d/d.

Potash, Caustic.—Solid, £65 10s. per ton for 1-ton lots; flake, £76 per ton for 1-ton lots. Liquid, d/d, nominal.

Potassium Bichromate. — Crystals and granular, 9¾d. per lb.; ground, 10¾d. per lb., for not less than 6 cwt.; 1-cwt. lots, ½d. per lb. extra.

Potassium Carbonate.—Calcined, 98/100%, £64 per ton for 1-ton lots, ex store; hydrated, £58 for 1-ton lots.

Potassium Chlorate.—Imported powder and crystals, nominal.

Potassium Chloride.—Industrial, 96 per cent, 6-ton lots, £16.10 per ton.

Potassium Iodide.—B.P., 8s. 8d. to 12s. per lb., according to quantity.

Potassium Nitrate.—Small granular crystals, 76s. per cwt. ex store, according to quantity.

Potassium Permanganate.—B.P., 1s. 8½d. per lb. for 1-cwt. lots; for 3 cwt. and upwards, 1s. 8d. per lb.; technical, £7 14s. 3d. to £8 6s. 3d. per cwt., according to quantity d/d.

Potassium Prussiate.—Yellow, nominal.

Salammoniac.—First lump, spot, £48 per ton; dog-tooth crystals, £50 per ton; medium, £48 10s. per ton; fine white crystals, £21 to £25 per ton, in casks, ex store.

Salicylic Acid.—MANCHESTER: 1s. 11d. to 3s. 1d. per lb. d/d.

Soda Ash.—58° ex depôt or d/d, London station, £7 12s. 6d. to £8 7s. 6d. per ton.

Soda, Caustic. — Solid 76/77%; spot, £18 4s. per ton d/d.

Sodium Acetate.—£41 per ton, ex wharf.

Sodium Bicarbonate.—Refined, spot, £11 per ton, in bags.

Sodium Bichromate.—Crystals, cake and powder, 8d. per lb.; anhydrous, 7¼d. per lb., net, d/d U.K. in 7-8 cwt. casks.

Sodium Bisulphite. — Powder, 60/62%, £28 7s. 6d. per ton d/d in 2 ton lots for home trade.

Sodium Carbonate Monohydrate.—£25 per ton d/d in minimum ton lots in 2-cwt. free bags.

Sodium Chlorate.—£45 to £47 per ton.

Sodium Cyanide.—100 per cent basis, 8d. to 9d. per lb.

Sodium Fluoride.—D/d, £4 10s. per cwt.

Sodium Hyposulphite.—Pea crystals 22s. 6d. per cwt. (2-ton lots); commercial, 1-ton lots, £17 per ton carriage paid. Packing free.

Sodium Iodide.—B.P., for not less than 28 lb., 10s. 2d. per lb.

Sodium Metaphosphate (Calgon).—Flaked, loose in metal drums, £103 ton.

Sodium Metasilicate.—£19 5s. per ton, d/d U.K. in ton lots.

Sodium Nitrate.—Chilean Industrial, 97-98 per cent, 6-ton lots, d/d station, £19 15s. per ton.

Sodium Nitrite.—£22 per ton.

Sodium Percarbonate.—12½% available oxygen, £7 per cwt. in 1-cwt. drums.

Sodium Phosphate.—Di-sodium, £32 10s. per ton d/d for ton lots. Tri-sodium, £62 per ton d/d for ton lots.

Sodium Prussiate.—9d. to 9½d. per lb. ex store.

Sodium Silicate.—£6 to £11 per ton.

Sodium Silicofluoride.—Ex store, nominal.

Sodium Sulphate (Glauber Salt).—£8 per ton d/d.

Sodium Sulphate (Salt Cake).—Unground. Spot £4 11s. per ton d/d station in bulk. MANCHESTER: £4 15s. per ton d/d station.

Sodium Sulphide. — Solid, 60/62%, spot, £23 per ton, d/d, in drums; broken, £23 15s. per ton, d/d, in casks.

Sodium Sulphite.—Anhydrous, £29 10s. per ton; pea crystals, £20 10s. per ton d/d station in kegs; commercial, £12 to £14 per ton d/d station in bags.

Sulphur.—Per ton for 4 tons or more, ground, £14 12s. 6d. to £16 17s. 6d., according to fineness.

Sulphuric Acid.—168° Tw., £6 10s. 2d. to £7 10s. 2d. per ton; 140° Tw., arsenic-free, £5 2s. 6d. per ton; 140° Tw., arsenious, £4 15s. per ton. Quotations naked at sellers' works.

Tartaric Acid.—Per cwt., for 10 cwt. or more, £15 8s.; 5 to 10 cwt., £15 9s. 6d.; 2 to 5 cwt., £15 11s.; 1 to 2 cwt., £15 13s. Less than 1 cwt., 3s. 1d. to 3s. 3d. per lb. d/d, according to quantity.

Tin Oxide.—1-cwt. lots d/d £25 10s.

Titanium Oxide.—Comm., ton lots, d/d, (56 lb. bags), £97 per ton.

Zinc Oxide.—Maximum prices per ton for 2-ton lots, d/d; white seal, £75 10s.; green seal, £74 10s.; red seal, £73.

Zinc Sulphate.—No quotation.

Rubber Chemicals

Antimony Sulphide.—Golden, 3s. to 4s. per lb. Crimson, 2s. 7½d. to 3s. per lb.

Arsenic Sulphide.—Yellow, 1s. 9d. per lb.

Barytes.—Best white bleached, £8 3s. 6d. per ton.

Cadmium Sulphide.—6s. to 6s. 6d. per lb.

Carbon Bisulphide.—£37 to £41 per ton, according to quality, in free returnable drums.

Carbon Black.—6d. to 8d. per lb, according to packing.

Carbon Tetrachloride.—£50 10s. to £53 10s. per ton, according to quantity.

Chromium Oxide.—Green, 2s. per lb.

India-rubber Substitutes.—White, 10 5/16d. to 1s. 5½d. per lb.; dark, 10½d. to 1s. per lb.

Lithopone.—30%, £33 12s. 6d. per ton.

Mineral Black.—£7 10s. to £10 per ton.

Mineral Rubber, "Rupron."—£20 per ton.

Sulphur Chloride.—7d. per lb.

Vegetable Lamp Black.—£49 per ton.

Vermilion.—Pale or deep, 15s. 6d. per lb. for 7-lb. lots.

Nitrogen Fertilisers

Ammonium Phosphate.—Not quoted—temporarily unobtainable.

Ammonium Sulphate.—Per ton in 6-ton lots, d/d farmer's nearest station, in January, £10 5s., rising by 1s. 6d. per ton per month to March, 1948.

Calcium Cyanamide.—Nominal; supplies very scanty.

Concentrated Fertilisers. — Per ton d/d farmer's nearest station, I.C.I. No. 1 grade, where available, £14 18s. 6d.

"Nitro-Chalk."—£10 4s. per ton in 6-ton lots, d/d farmer's nearest station.

Sodium Nitrate.—Chilean super-refined for 6-ton lots d/d nearest station, £17 5s. per ton; granulated, over 98%, £16 per ton.

Coal-Tar Products

Benzol.—Per gal. ex works: 90's, 2s. 6d.; pure, 2s. 8½d.; nitration grade, 2s. 10½d.

Carbolic Acid. — Crystals, 11½d. per lb. Crude, 60's, 3s. 6d. to 4s. MANCHESTER: Crystals, 9½d. to 11½d. per lb., d/d; crude, 4s. 3d., naked, at works.

Creosote.—Home trade, 6½d. to 9½d. per gal., according to quality, f.o.r. maker's works. MANCHESTER: 6½d. to 9½d. per gal.

Cresylic Acid.—Pale, 97%, 3s. 6d. per gal.; 99%, 4s. 2d.; 99.5/100%, 4s. 4d. American, duty free, 4s. 2d., naked at works. MANCHESTER: Pale, 99/100%, 4s. 4d. per gal.

Naphtha.—Solvent, 90/160°, 2s. 10d. per gal. for 1000-gal. lots; heavy, 90/190°, 2s. 4d. per gal. for 1000-gal. lots, d/d. Drums extra; higher prices for smaller lots. Controlled prices.

Naphthalene.—Crude, ton lots, in sellers' bags, £8 1s. to £12 13s. per ton according to m.p.; hot-pressed, £14 15s. to £15 14s. per ton, in bulk ex works; purified crystals, £28 to £43 5s. per ton. Controlled prices.

Pitch.—Medium, soft, home trade, 100s. per ton f.o.r. suppliers' works; export trade, £7 10s. per ton f.o.b. suppliers' port. MANCHESTER: 100s. f.o.r.

Pyridine.—90/140°, 18s. per gal.; 90/160°, 14s. MANCHESTER: 16s. 6d. to 20s. per gal.

Toluol.—Pure, 3s. 2½d. per gal.; 90's, 2s. 4d. per gal. MANCHESTER: Pure, 3s. 2½d. per gal. naked.

Xylol.—For 1000-gal. lots, 3s. 3½d. to 3s. 6d. per gal., according to grade, d/d.

Wood Distillation Products

Calcium Acetate.—Brown, £15 per ton; grey, £22.

Methyl Acetone.—40/50%, £56 to £60 per ton.

Wood Creosote.—Unrefined, from 3s. 6d per gal., according to boiling range.

Wood Naphtha.—Miscible, 4s. 6d. to 5s. 6d. per gal.; solvent, 5s. 6d. to 6s. 6d. per gal.

Wood Tar.—£6 to £10 per ton.

Intermediates and Dyes (Prices Nominal)

***m*-Cresol** 98/100%.—Nominal.

***o*-Cresol** 30/31° C.—Nominal.

***p*-Cresol** 34/35° C.—Nominal.

Dichloraniline.—2s. 8½d. per lb.

Dinitrobenzene.—8½d. per lb.

Dinitrotoluene.—48/50° C., 9½d. per lb.; 66/68° C., 1s.

***p*-Nitraniline.**—2s. 5d. per lb.

Nitrobenzene.—Spot, 5½d. per lb. in 90-gal. drums, drums extra, 1-ton lots d/d buyers' works.

Nitronaphthalene.—1s. 2d. per lb.; P.G. 1s. 0½d. per lb.

***o*-Toluidine.**—1s. per lb., in 8/10-cwt. drums, drums extra.

***p*-Toluidine.**—2s. 2d. per lb., in casks.

***m*-Xylidine Acetate.**—4s. 5d. per lb., 100%.

Latest Oil Prices

LONDON.—May 26. For the period ending May 29, 1948 (June 19, 1948, for refined oils). Per ton, naked, ex mill, works or refinery, and subject to additional charges according to package; LINSEED OIL, crude, £200. RAPESEED OIL, crude, £190. COCONUT OIL, crude, £106 refined deodorised, £112 refined hardened deodorised, £116. PALM KERNEL OIL, crude, £105 10s., refined deodorised, £112; refined hardened deodorised, £116. PALM OIL (per ton c.i.f.), in returnable casks, £99 5s.; in drums on loan, £98 15s., in bulk, £97 15s. GROUNDNUT OIL, crude, £110 10s.; refined deodorised, £114. refined hardened deodorised, 40 deg. £118. WHALE OIL, refined hardened, 42 deg., £117; refined hardened, 46/48 deg., £118. ACID OILS, Groundnut, £94; soya, £92; coconut and palm-kernel, £97 10s. ROSIN: Wood, 40s. 6d. to 48s.; gum, 56s. to 62s. 6d. per cwt., ex store, according to grade. TURPENTINE. American, 87s. per cwt. in drums or barrels, as imported (controlled price).

Officers Appointed

Institute of Physics

DR. F. C. TOY, director of research, the British Cotton Industry Research Association, was last week elected as president of the Institute of Physics. DR. T. E. ALLIBONE was elected vice-president, and MR. E. R. DAVIES and DR. B. P. DUDDING were re-elected hon. treasurer and hon. secretary respectively. MR. J. H. AWBERY and MR. E. W. H. SELWYN were elected as ordinary members of the board, and DR. G. B. B. M. SUTHERLAND was appointed as the new representative of the Faraday Society.

Industrial Pest Control

Officers and executive committee of the Industrial Pest Control Association for the current year are as follows: President, MR. G. MCLAREN; vice-president, DR. F. P. COYNE; hon. treasurer, MR. C. STUART KREGOR; hon. auditors: MR. T. A. ACTON, DR. D. R. LEITCH. Executive committee: MESSRS. R. G. BERCHEM, J. W. HEDGCOCK, W. HIVEY, R. P. MERRITT, J. B. WILTON, ANGUS F. MCINTOSH (*ex officio*). Joint secretaries: MESSRS. ALLAN J. HOLDEN, and W. A. WILLIAMS.

Sheep Dip Manufacturers

The following have been elected officers and executive committee of the Association of British Sheep and Cattle Dip Manufacturers for 1948: Chairman, MR. D. O. MARSHALL; vice-chairman, MR. V. G. GIBBS; hon. treasurer, MR. W. E. O. WALKER LEIGH. The following comprise the executive committee: MESSRS. H. W. BARKER, R. J. HOPE, R. W. LOWE, A. S. ROXBURGH, H. A. SMITH, W. M. MACMILLAN (*ex officio*). Secretary, MR. W. A. WILLIAMS.

Students at Conference

In order to stimulate the interests of young men and women in the technical aspects of the textile industry and to give them the opportunity of meeting experts in various branches of research, the Technical Institute has invited ten selected students of textile technology, from all parts of the country, to attend its annual conference at Buxton next month. During four days as guests of the Institute the pupils will listen to contributions and join in the discussions.

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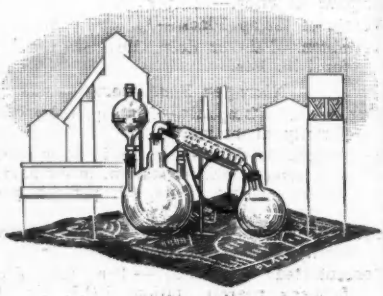

PLANNING *and* PRODUCTION

Laboratory standards of purity are applied at Poole to industrial scale production: production planned to supplement the drive for exports now and to keep step with the development of new industries and new processes in the future.

Many new processes need new chemical materials — chemicals in quantity, conforming to new standards — laboratory reagents which have become the critically tested raw materials for direct manufacturing operations.

Such chemicals are made at Poole as

B.D.H.

FINE CHEMICALS FOR INDUSTRY

Enquiries are invited for all important inorganic salts for existing processes or for planned developments. Materials can be supplied to meet the most exacting specifications.

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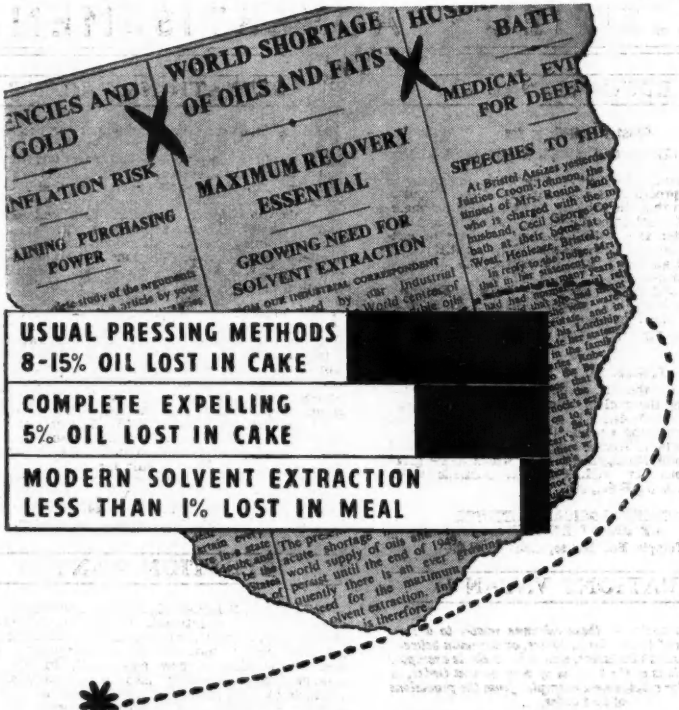
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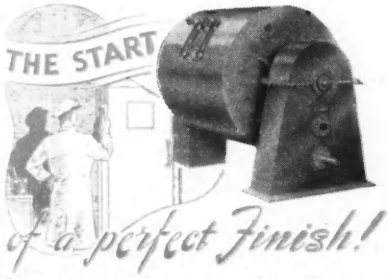

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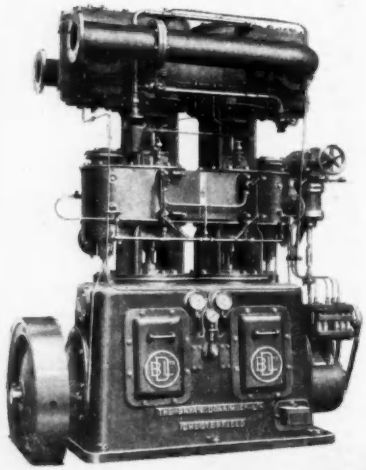

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for pressures up to 100 lb. per sq. in.

Automatic Control
Forced Lubrication
Easy Accessibility
to Working Parts

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